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ORGANIZATIONAL CLIMATE AND CLIMATE STRENGH - THREE ESSAYS

Ding Ashley Bin

UNIL | Université de Lausanne

FACULTÉ DES HAUTES ÉTUDES COMMERCIALES

DÉPARTEMENT DE COMPORTEMENT ORGANISATIONNEL

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THÈSE DE DOCTORAT

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Jury

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Sans se prononcer sur les opinions de l'autrice, la Faculté des Hautes Etudes Commerciales de l'Université de Lausanne autorise l'impression de la thèse de Madame Ashley Bin Ding, licenciée en Management des Systèmes d'Information de Hefei University of Technology, titulaire d'un master en Philosophie de l'Université Polytechnique de Hong Kong, en vue de l'obtention du grade de docteure ès Sciences Economiques, mention "Management".

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THREE ESSAYS

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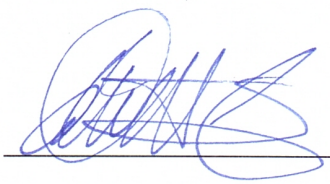
Signature:  Date: 6/12/2017

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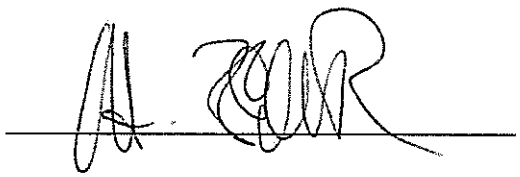
Signature:  Date: 07.12.2017

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Originating from the Gestalt psychology, organizational climate research has accumulated for several decades. Organizational climate refers to employees' shared perceptions of the policies, practices, and procedures that an organization rewards, supports, and expects (Schneider and Reichers, 1983), and it has been shown to have a significant and positive relationship with employee and organizational outcomes (Carr et al., 2003). Although systematic quantitative organizational climate research starts as early as the1970s, only recently, the literature in organizational climate has been formally integrated (Kuenzi and Schminke, 2009; Schneider et al., 2011; Schneider, Ehrhart, and Macey, 2013; Schneider, Gonzalez-Roma, Ostroff, and West, 2017).

In some of the earlier work (e.g., James et al., 1978), people conceptualize organizational climate as an individual-level construct. However, subsequently, climate scholars argue that employee perceptions are shared, and they ultimately reach a consensus that organizational climate should be considered as an aggregate-level construct. The aggregated characteristic of organizational climate indicates that it is a property of a unit, and the aggregated characteristic of organizational climate is manifested in two aspects, climate level and climate strength. Climate level, or simply organizational climate, refers to the positiveness of organizational climate (Bowen and Schneider, 2014), or the average of employee perceptions of organizational climate. Climate strength indicates how strong an organizational climate is, and it is the degree of agreement or consensus among employee climate perceptions. Early work of organizational climate has predominantly focused on the climate level facet, and since Chan (1998) first proposed the term climate strength, empirical research starts to accumulate on this facet of organizational climate.

At the beginning, organizational climate is typically conceptualized as a molar construct that captures a wide range of aspects of work environment. It is sometimes called a climate for well-being with a focus on leadership and supervisory styles (Schneider, Ehrhart, and Macey, 2011; Carr et al., 2003; Kuenzi and Schminke, 2009). As the construct develops, scholars advocate that the organizational climate construct should have a specific focus, that is, a climate for something, for example, a climate for service (Schneider et al., 1998) and a procedural justice climate (Zohar and Luria, 2004). The difference between molar climate and focused climate mainly lies in their bandwidth, such that a focused climate examines a more narrow manifestation of the work environment than a molar climate (Carr et al., 2003). Furthermore, focused climates are usually matched with focused outcomes, for example, service climate with service quality, safety climate with injury rate.

The vast majority of studies have treated organizational climate, either molar climate or focused climates, both climate level and climate strength, as if they were exogenous (e.g., Schneider, Salvaggio, & Subirats, 2002; Bernhardt, Donthu, & Kennett, 2000). However, organizational climate is actually an endogenous variable, rendering its two facets endogenous too. There are several reasons for climate strength and climate level to be considered endogenous – for example, omitted variable bias, measurement error and common method bias (cf. Antonakis, Bendahan, Jacquart, & Lalive, 2010) – and the endogeneity problem may render estimates causally uninterpretable. The problem of endogeneity has been mentioned in psychology, organizational behavior, and strategy research (e.g., Antonakis & House, 2014; Bascle, 2008; Gennetian, Magnuson, & Morris, 2008). In organizational climate research, the endogeneity problem has been largely ignored. To ensure the consistency of the estimations, this problem should be seriously considered and solved.

Situated in organizational climate research, the three papers of my Ph.D. dissertation aim to contribute to the literature with two main focuses on service climate and climate strength, and discuss the endogeneity issue in organizational climate research and provide possible suggestions for future research. Papers 1 and 2 treat service climate as the focal construct. As one of the focused climates, service climate has received the most empirical examination in the literature. Recent narrative reviews and meta-analyses have provided nice summaries of the service climate literature (Bowen and Schneider, 2014; Hong et al, 2013; Subramony and Pugh, 2015). Extant research has identified various antecedents, outcomes of service climate, as well as the boundary conditions of the effect of service climate. Extending the current knowledge of service climate, Papers 1 and 2 offer new perspectives. Paper 1 includes leaders as another source of service climate perceptions and looks at service climate from the perspectives of both leaders and employees, and indicates the importance of treating leader-perceived service climate as a construct of interest. Paper 2 studies the joint associations of service climate and product quality climate with customer satisfaction. By examining multiple focused climates simultaneously, Paper 2 helps us gain a richer understanding of how these two focused climates operate simultaneously in service settings. Paper 2 identifies product quality climate as a boundary condition of the effect of service climate on customer satisfaction. Paper 3 synthesizes the research on climate strength and summarizes the literature in an integrative framework. We conclude Paper 3 with some critiques of current research in climate strength and organizational climate, make three main observations, namely, the relationship between climate level and climate strength, the endogeneity problem in organizational climate research, and the influence process of climate strength and provide suggestions to guide future research.

Next, I present the three papers one by one. I conclude the thesis with an overall consolidation of the findings and contributions of my dissertation.

CHAPTER 1. PERCEPTUAL CONGRUENCE OF SERVICE CLIMATE BETWEEN LEADERS AND EMPLOYEES AND ITS EFFECT ON CUSTOMER SATISFACTION

1.1 INTRODUCTION

Service climate research has long recognized the central role leaders play in creating and maintaining service climate (e.g., Bowen & Schneider, 2014). Leaders behave as "climate engineers" (Kozlowski & Doherty, 1989) – they create service climate by establishing service-focused policies, practices and procedures, and rewarding exceptional service behaviors. Extant studies predominantly focus only on employee perceptions of service climate, which is potentially problematic. For example, when employees perceive service climate to be low, it is not clear whether it simply does not exist, or it cannot be perceived or wrongly perceived by employees. Several researchers have raised concerns about understanding service climate from the perspective of employees only, and they suggest incorporating leaders as raters of service climate (Dean, 2006; Bowen & Schneider, 2014). This study aims to answer this call.

The objective of this paper is to include leaders as raters of service climate in addition to employees. Prior research shows that leaders and employees may diverge in their perceptions regarding organizational factors (Bashshur, Hernandez, & Gonzalez-Roma, 2011; Liao, Toya, Lepak & Hong, 2009; McKay, Avery, & Morris, 2009; Gibson, Cooper & Conger, 2009), and that only when divergent perceptions of leaders and employees are minimized, organizational outcomes are at a high level. Following this line of research, this paper examines the perceptual congruence of leaders and employees regarding service climate. In the literature of service climate, one of the most robust outcomes of service climate is customer experience and satisfaction (e.g., Bowen and Schneider, 2014; Dietz, Pugh and Wiley, 2004). Extending this line of research,

this research examines the perceptual congruence of service climate between leaders and employees and its influence on customer satisfaction.

This research makes several contributions to service climate research. First, this study is among the first to include leaders as raters of service climate. It underscores the necessity of using leaders as another source of service climate perceptions. Second, this paper not only examines the effect of leader perceptions of service climate on customer satisfaction, it also theorizes and tests perceptual congruence between leaders and employee. We argue that apart from employee perceptions, it is important to minimize the perceptual difference between leaders and employees of service climate.

In what follows, we first present the hypotheses and their theoretical underpinnings. We then present the methods and results. We finally discuss the theoretical and practical implications of the findings.

1.2 THEORY AND HYPOTHESES

Organizational climate research starts to focus on the organizational level of analysis since the 1970s (cf. Schneider, 1975). Before then, organizational climate was predominantly conceptualized as an individual-level construct, which is also called psychological climate (James and Jones, 1974; James et al., 2008). The major difference between organizational-level and individual-level climate lies in whether it reflects an attribute of the environment or an individual's affective processing of the environment (James et al., 2008; Schneider and Reichers, 1983). Organizational climate is a property of the organization/unit, that is, it is an organization's climate, not an individual's (Schneider, Ehrhart and Macey, 2011). That being said, within a given organization, all the individual employees see the same organizational climate. Moreover, employees' climate perceptions are shared and have a certain level of consensus within the organization.

With the assumption that employees in the same organization are exposed to the same climate, it is reasonable that prior research normally aggregates all respondents' perceptions, that is, average all respondents' climate ratings (e.g., Dietz, Pugh, & Wiley, 2004; Schneider, Ehrhart, Mayer, Saltz, and Niles-Jolly; 2005). However, scholars argue that there may be divergence in employees' perceptions of organizational factors due to their roles and positions. For example, Zohar (2000) notes that "although instituted procedures and supervisory practices are hierarchically related in a top-down fashion, there can be significant between-groups variation, resulting in distinctively different perceptions of instituted procedures versus supervisory practices in individual subunits." Similarly, Liao, Toya, Lepak, & Hong (2009) make similar arguments regarding high-performance work systems (HPWS), "we should not assume homogeneity of employee experience with the HPWS across employees of different employment groups," and they found significant differences in HPWS perceptions among different employee groups. Based on these arguments and findings, employees in different positions, that is, leaders and employees, may have divergent perceptions of organizational climate. However, given that both leaders and employees see the same organizational climate, organizational climate rated by either group would be associated with corresponding organizational outcomes, and the less divergent the perceptions between leaders and employees, the better would the outcomes be.

1.2.1 Organizational Climate as an Organizational-level Construct

Based on the above-mentioned conceptualization, below, we use service climate as an example to theorize the effect of leader and employee service climate perceptions on customer satisfaction. Given that both leaders and employees see the same organizational climate, we further propose that the less divergent the perceptions between leaders and employees, the better would the outcomes be.

1.2.2 Service Climate and Customer Satisfaction

Service climate refers to incumbent employees' shared perceptions of focused policies, practices and procedures that they experience and the service behaviors they observe that are rewarded, supported, and expected with regard to service quality (Bowen and Schneider, 2014). When an organization has a climate for high quality service, leaders act as agents to take the initiative to carry out the service climate by building incentive structures and demonstrating leadership (Schneider et al., 2005). In this way, leaders make the service climate more visible to employees, resulting in employees behaving in a way that the organizational strategy guides them. Employees' high quality service in turn makes customers satisfied. Therefore, we propose that,

H1a. Leader-perceived service climate is positively related to customer satisfaction.

Extant research extensively examines and reveals the positive relationship between employee-perceived service climate and customer satisfaction (e.g., Bowen and Schneider, 2014; Hong, Liao, Hu and Jiang, 2013; Schneider et al., 1998). Relationships between service climate and customer satisfaction have been examined in various settings (e.g., bank branches, supermarket chains, restaurants, financial service firms) and at various aggregate levels of analysis (e.g., group level, branch/unit/store level, organizational level) (e.g., de Jong, Ruyter, & Lemmink, 2004; Schneider, White, & Paul, 1998; Dietz, Pugh, & Wiley, 2004; Schneider, Ehrhart, Mayer, Saltz, & Niles-Jolly, 2005; Liao & Chuang, 2004; Susskind, Kacmar, & Borchgrevink, 2003). Thus, we replicate prior research and propose that,

H1b. Employee-perceived service climate is positively related to customer satisfaction.

1.2.3 Perceptual Congruence of Service Climate between Leaders and Employees

Scholars have studied perceptual congruence of construct of interest under different names, such as perceptual fit, perspective consistency, perceptual distance and perceptual differ-

ences (e.g., Ostroff, Shin & Kinicki, 2005; Gibson, Cooper & Conger, 2009; McKay, Avery & Marris, 2009; Bashshur, Hernández & González-Romá, 2011). Before discussing the effect of perceptual congruence of service climate on customer satisfaction, we first present our theoretical arguments of the potential causes of leaders and employees' perceptual difference.

Perceptual difference refers to the differences of aggregated perceptions between two groups, for example, leaders and employees. One possible reason for this perceptual difference may be that leaders might have more information and knowledge about the strategic aspects of an organization due to their leadership roles. There could be a self-serving bias that makes leaders perceive service climate to a more positive level. However, it should be noted that we are not talking about sub-climates between different groups. Because service climate is a property of a unit, leaders and employees are seeing the same service climate. If the service messages embedded in the policies, practices and procedures are understandable, consistent, unambiguous and clear (Bowen and Ostroff, 2004), leaders and employees should have similar perceptions of the service climate. Below, we propose our arguments regarding how perceptual congruence between leaders and employees lead to customer satisfaction. More specifically, we discuss when customer satisfaction is maximized or minimized as a result of perceptual congruence or incongruence.

Perceptual congruence has a reinforcing effect (Byrne, 1971). When leaders and employees reach a consensus regarding service climate, not only leaders perceive that a service climate is valued, but employees see eye to eye with the leaders. Leaders' service messages are well communicated to employees, and employees agree with the service messages, memorize them and incorporate them in their service behaviors (Bowen and Ostroff, 2004). In this way, perceptual congruence reinforces employee service performance and ultimately predicts customer satis-

faction, be it high or low. On the contrary, when there is perceptual difference between leaders and employees, employee perceptions and service behaviors are not confirmed by the leaders. Employees are not incentivized and hence they are not motivated enough and they are likely to maintain the status quo. As a result, customer satisfaction will be at a medium level. Taking into account the above argument, customer satisfaction will be at a more extreme level, the highest or the lowest, when leader and employee perceptions are congruent than not congruent.

When leader and employee perceptions are congruent and service climate level is high, leaders make good policies and procedures and employees implement them well by engaging in good service behaviors. Superior employee service behaviors then are highly rewarded by leaders, which encourages even better service behaviors (Schneider, White and Paul, 1998). Ultimately, this virtuous cycle results in the highest service performance and in turn customer satisfaction. In contrast, when leaders and employees have perceptual congruence regarding service climate and service climate level is low, leaders do not expect quality service from the employees or support employees' service behaviors, and employees do not believe superior service behaviors are desired by their organization. Employees' unsatisfactory service quality is thus not punished by their leaders, so that employees are likely to maintain the status quo or engage in even worse service behaviors. Ultimately, this vicious cycle results in the lowest service performance and in turn the lowest level of customer satisfaction. Based on the above arguments, we propose the following hypotheses:

H2. Customer satisfaction will be the highest when leader and employee service climate perceptions are congruent and high and will be the lowest when leader and employee service climate perceptions are congruent and low. Customer satisfaction will be at a medium level when leader and employee perceptions are not congruent.

1.3. METHOD

1.3.1 Overview

We collected data from 52 restaurants in China. Data came from multiple sources – employees, leaders, customers and census data. Employee and leader data were collected using survey questionnaires. Employees and leaders evaluated service climate. Customer satisfaction data were collected from online evaluations from four large customer review websites. Control variables came from employees, leaders and census data.

1.3.2 Sample

A total of 589 employees from the 52 restaurants participated in the survey. The average employee respondent number per store was 11.46 (*s.d.* = 5.93). Employee respondents worked in different departments in restaurants, such as reception, catering, kitchen and logistics. The mean age of employee respondents was 29.36 (*s.d.* = 8.79). Among the respondents, 70% were female and 48% had an education level below high school. They had an average organizational tenure of 18.25 months (*s.d.* = 25.42).

One hundred and seventy-four managers participated in the survey with an average respondent number of 3.58 (*s.d.* = 2.34) per store. A large majority (66%) of the leader respondents worked in the reception, catering and kitchen departments. The mean age of leader respondents was 35.73 (*s.d.* = 8.36). Among the respondents, 66% were female and 73% had an education level above high school. They had an average organizational tenure of 42.48 months (*s.d.* = 57.42).

Due to pragmatic reasons, we used a convenience sample online to collect customer satisfaction data. We collected customer online reviews from four large customer review websites[1].

[1] The four customer review websites were: www.dianping.com, www.ctrip.com, www.meituan.com, www.class01.com

The advantage of using online customer sample was its availability and quickness. The disadvantage would be the risk that the sample had a self-selection bias and might not represent the whole population. The mean of customer satisfaction was 4.37. The standard error of the mean was .03, with a 95% confidence interval as [4.30, 4.43]. A skewness test showed that our customer data was negatively skewed, χ^2 (2) = 24.75 ($p < .001$). Although we had a large sample size in our dataset, that is, a total of 43,525 customers provided their evaluations, with a per-store average of 837.02 (*s.d.* = 1221.89), our data clustered at the high end. We will discuss this problem in detail in limitation.

1.3.3 Procedure

We selected 100 restaurants in different cities in China. In these restaurants, we first talked to each restaurant manager in order to obtain permission to distribute questionnaires. Among the 100 restaurants, 52 managers agreed to participate in the study.

In the spare time of employees, normally during 8:00-10:00 in the morning and 14:00-16:00 in the afternoon, we distributed questionnaires to the participants. To ensure maximum participation, in each store, we invited all the employees who happened to be in the store to participate. Before distributing the questionnaires, we made sure who were managers and who were employees by asking the store manager. After knowing their roles, we distributed leader questionnaires to leaders and employee questionnaires to employees. In the questionnaire, we confirmed respondents' leadership roles by asking their positions as leaders or employees.

After we collected the employee and leader data, we had the names and addresses of all the stores. With these detailed information, we identified the customer evaluations for each store on the four websites we mentioned above. After identifying the stores, we collected customer evaluations after November 2015, the time point when we collected the employee and leader data. For

those restaurants which had customer evaluations on more than one website, we took the averages of the evaluations across different websites.

1.3.4 Measures

Service Climate. Service climate was assessed with a seven-item measure developed by Schneider, White and Paul (1998). A sample item was "How would you rate the job knowledge and skills of employees in your restaurant to deliver superior quality work and service?" The items were assessed using a 5-point Likert scale, ranging from 1 "poor" to 5 "excellent." This scale was used to measure both leader and employee perceptions of service climate.

For the measure of employee-perceived service climate, Cronbach's alpha was .93. We assessed the appropriateness of aggregation to the store level by assessing the intraclass correlation coefficients, ICC(1) and ICC(2), as well as an estimator of interrater agreement, r_{wg}. ICC(1)s, which measure the amount of variance explained by between-variance differences, was .48 ($F_{46, 235} = 6.53$, $p < .001$). ICC(2)s, which indicate interrater reliability, was .85. r_{wg} was a measure of interrater agreement. We used the uniform distribution as the null distribution. The mean and median values of r_{wg} were .95 and .97 with a standard error of .00.

For the measure of leader-perceived service climate, Cronbach's alpha was .92. ICC(1) was .55 ($F_{46, 47} = 3.48$, $p < .001$). and ICC(2) was .71. We used the uniform distribution as the null distribution for r_{wg}. The mean and median values of r_{wg} were .96 and .98 with a standard error of .00.

Customer Satisfaction. Customer evaluations were obtained from four customer review websites to measure customer satisfaction. For each restaurant, customers provided ratings for three factors, that is, flavor, service and environment. In two of the websites (i.e., www.dianping.com and www.class01.com), the three factors were measured with a 10-point

scale, ranging from 1 (the lowest) to 10 (the highest). In the other two websites (i.e., www.ctrip.com and www.meituan.com), the three factors were measured with a 5-point scale, ranging from 1 (the lowest) to 5 (the highest). Because all the other variables in this study (e.g., service climate) were measured with 5-point scales, we transformed the ratings on www.dianping.com and www.class01.com to 5-point scales. We computed the averages of ratings on the three factors (i.e., flavor, service and environment) across the four websites, and then we computed the final customer satisfaction ratings by taking the averages of the three factors. The means and standard deviations of the final customer satisfaction ratings were 4.37 (*s.d.* = .24). A full list of measures is presented in Appendix.

Control Variables. We controlled for median income of the cities that the restaurants were located in, which was obtained from census data. Median income was shown to be correlated with customer satisfaction because affluent customers are hard to be pleased (Dietz et al., 2004). We controlled for the customer contact frequency because prior research showed that the contact frequency between service employees and customers might influence customer satisfaction (Dietz et al., 2004). Customer contact frequency was measured by asking employees "How many customers do you contact on average everyday?" We took the averages of employees' answers for each store. We controlled for store size, which was measured as the total number of employees in each store. Store size was provided by leaders. Because the number of customer reviews varied across different stores, we also controlled for the number of customer respondents for each restaurant.

1.3.5 Estimation Strategy

We first used the five factors of leader personality as instrumental variables for leader and employee perceptions of service climate. Leader personality has been shown to be a valid in-

strument for leadership (cf. Antonakis et al., 2010). Antonakis and House (2014) argue that leader personality is stable individual difference that can be used to eliminate the potential threat from endogeneity. They also find that leader personality is a valid instrument for leadership style (Antonakis et al., 2010; Antonakis and House, 2014). In service climate research, leadership is found to be a strong and stable predictor of service climate (Hong et al., 2013; Schneider et al., 2005). Although we did not model leadership in this study, given the strong correlation between leader personality and leadership, and that between leadership and service climate, we chose to use leader personality as an instrumental variable for service climate.

Leaders evaluated the five factors of personality using the 44-item Big Five Trait Inventory developed by John and Srivastava (1999). The Big Five Trait Inventory included such factors as openness to experience, extraversion, agreeableness, conscientiousness, and neuroticism. Sample items included "I see myself as someone who is talkative" and "I see myself as someone who is outgoing, sociable." Cronbach's alphas for openness to experience, extraversion, agreeableness, conscientiousness, and neuroticism were .85, .74, .77, .74 and .84, respectively.

We used the five factors of personality as instruments for leader perceptions of service climate and employee perceptions of service climate, and used the product of openness and other factors as instruments for the interaction term. The validity of these instruments was examined. First, we examined first-stage F tests. The *F*-statistics for leader perceptions of service climate, and employee perceptions of service climate and their interaction were 1.06 ($p > .05$), 1.74 ($p > .05$), and 1.70 ($p > .05$). These F-statistics were far lower than the rule of thumb of 10 (Staiger and Stock, 1997). Our instruments were thus very weak. Second, we conducted a Sargan over-identification test. The Sargan statistic ($\chi 2\ (3) = 3.87$, $p > .05$) showed that our instruments were not correlated with structural error term. The second requirement was met.

Because leader personality as an instrument was too weak to be valid, we tried other variables as instruments. We then used the five factors of leader personality and unit size as instruments for leader-perceived and employee perceived service climate. The interaction of leader perceptions of service climate and employee perceptions of service climate was instrumented with the product of the five factors and unit size. Prior research shows that unit size can be used as a valid instrument for different variables. For example, Chan and Chen (1988) use firm size as an instrumental variable for risk, Reynaga and Renson (2012) use firm size as an instrumental variable for wages. Because unit size was found to be closely related to service climate (e.g., Dietz et al., 2004; Schneider et al., 2003), it could be used as an instrument for service climate. The *F*-statistics were even lower. The *F*-statistics for leader perceptions of service climate, and employee perceptions of service climate and their interaction were 0.72 ($p > .05$), 0.96 ($p > .05$), and 0.99 ($p > .05$). The Sargan statistic was $\chi 2\ (3) = 2.94$, $p > .05$. Therefore, these instruments again were not strong enough.

We also tried to use unit size and median income and their product as instruments. The *F*-statistics for leader perceptions of service climate, and employee perceptions of service climate and their interaction were 0.80 ($p > .05$), 0.75 ($p > .05$), and 0.65 ($p > .05$), which were too low to be above 10. The Sargan statistic was $\chi 2\ (3) = 0.93$, $p > .05$. Again, we could not use them as instruments.

Detailed results of all the weak instruments we tried were shown in Appendix B-D. Weak instruments could lead to severely biased estimates. For example, Stock, Wright, and Yogo (2002) in their seminal work argue that "if instruments are weak, then the sampling distributions of GMM and IV statistics are in general nonnormal, and standard GMM and IV point estimates, hypothesis tests, and confidence intervals are unreliable." (p. 518) Stated differently, if instru-

ments were weak, IV estimation could be more biased than ordinary least square (OLS; Bound, Jarger, & Backer, 1995). Stock, Wright, and Yogo (2002) also put that, "finding exogenous instruments is hard work, and the features that make an instrument plausibly exogenous, such as occurring sufficiently far in the past to satisfy a first-order condition or the as-if random coincidence that lies behind a quasi- experiment, can also work to make the instrument weak." In organizational climate research, there were limited studies using instrumental variable estimation. It was difficult to find good exogenous instruments and there were few studies to refer to (Stock, Wright, and Yogo, 2002). Due to these reasons, we decided to report the OLS estimation, which was extensively used in the literature (e.g., Dietz, Pugh & Wiley, 2004; Mayer, Ehrhart, & Schneider, 2009).

Below, I report the results.

1.4 RESULTS

1.4.1 Descriptive Statistics

Table 1.1 presents the means and standard deviations for, and the correlations among the variables.

Insert Table 1.1 about here

1.4.2 Measurement Model

We first conducted a confirmatory factor analysis (CFA) to assess the construct validity of service climate perceived by leaders and employees. The CFA was conducted at the store level. We first specified a model with one factor, service climate, with all the items from leaders and employees loaded on it. Model fit indices were as follows: χ^2 (77) = 186.56, $p < .001$; RMSEA =

.17; CFI = .80, and chi-square test with swain correction: χ^2 (77) = 165.41, p < .001. We then specified a model with two separate but correlated factors, that is, service climate perceived by leaders and service climate perceived by employees. Items were constrained on their corresponding factors. This two-factor model fit the data better than did a one-factor model: χ^2 (76) = 109.59, p < .001; RMSEA = .12; CFI = .91, and chi-square test with swain correction: χ^2 (76) = 97.87, p < .01. The two-factor model fit the model better, indicating that leader-perceived service climate and employee-perceived service climate could be considered as two separate factors.

Because we had significant chi square test, I decided to delete some of the items to improve the measurement model. Based on the two-factor model, I deleted Item 1 and Item 3 of leader perceived service climate and Item 6 of employee perceived service climate according to their relatively lower factor loadings. This deletion resulted in a non-significant chi square test with swain: χ^2 (43) = 55.45, p > .05; RMSEA = .09; CFI = .96. Therefore, this measurement model was retained for further analysis. We were mindful of the limitation of selecting items and validating the measurement model to the same sample. Such procedural was noted as capitalization on chance (MacCallum et al., 1992), resulting in the modified measurement model fitting our sample but might not generalize to other samples (MacCallum et al., 1992).

Insert Table 1.2 about here

1.4.3 Hypothesis Testing

We tested the hypotheses with Stata 14.0. Results are reported in Table 1.3.

Insert Table 1.3 about here

Hypothesis 1a proposed that leader-perceived service climate is positively related to customer satisfaction. As shown in Table 1.3, the relationship between leader-perceived service climate and customer satisfaction was positive and significant ($b = 1.39$, $p < .05$). Therefore, Hypothesis 1a was supported.

Hypothesis 1b proposed that employee-perceived service climate is positively related to customer satisfaction. The results supported Hypothesis 1b and showed that the relationship between employee-perceived service climate and customer satisfaction was positive and significant ($b = 1.34$, $p < .05$). Hypothesis 1b was supported

Hypothesis 2 proposed that customer satisfaction will be the highest when leader and employee service climate perceptions are congruent and high and will be the lowest when leader and employee service climate perceptions are congruent and low; moreover, customer satisfaction would be at a medium level when leaders' and employees' perceptions are incongruent. We tested this hypothesis by examining the interaction between leader-perceived service climate and employee-perceived service climate on customer satisfaction. Results showed that the interaction was significant ($b = -.31$, $p = .05$). Probing the interaction, we followed Aiken and West (1991) and used one standard deviation above and below the mean to represent high and low levels of leader and employee service climate perceptions. Interaction was plotted in Figure 1.1. Figure 1.1 showed that when leader perceptions and employee perceptions are congruent and high, or when incongruent, customer satisfaction was high. When leader perceptions and employee perceptions are congruent and low, customer satisfaction was low. Hypothesis 2 was only partly supported.

I also conducted additional analyses. The simple slopes showed that the relationship between employee-perceived service climate and customer satisfaction was approaching significant when leader-perceived service climate was low ($r = .29$, $p < .1$), and was not significant when leader-perceived service climate was high ($r = .01$, $p > .05$). The R-square of the model is .35. A bootstrapping of the R-square yields .35 with standard error of .13 and 95% confidence interval of [.10, .59]. Monte Carlo simulation showed that noise could generate an R-square of .13, which fell into the confidence interval, thus noise explained some variance of customer satisfaction, the dependent variable, in our model.

Insert Figure 1.1 about here

1.5 DISCUSSION

Prior service climate research predominantly focuses on employee-perceived service climate and links it to important organizational outcomes such as customer satisfaction and business performance (Bowen and Schneider, 2014; Hong et al., 2013). This paper includes leaders in addition to employees as raters of service climate and investigates how leader perceptions and employee perceptions jointly influence customer satisfaction. We find that both leaders' service climate perceptions and employees' service climate perceptions positively influence customer satisfaction. Moreover, customer satisfaction is low when leaders and employees have congruent perceptions and service climate is low.

1.5.1 Theoretical Contribution

This paper extends service climate research in several ways. First, this study is among the first to treat leader-perceived service climate as a construct of interest. Extensive prior research

shows the positive relationship between employee-perceived service climate and customer satisfaction, this study further shows that in addition to employees, leaders' service climate perceptions are also positively related to customer satisfaction, thus demonstrating the necessity to include leaders as reporters of service climate in future service climate research. Albeit most of the time leaders do not have direct interactions with customers, managerial perspective is valuable for predicting customer satisfaction.

Second, this study advances the service climate literature by examining the congruence of managerial and non-managerial service climate perceptions on customer satisfaction. Supporting our hypotheses, results show that customer satisfaction is the lowest when leaders and employees have congruent perceptions and service climate is low, and customer satisfaction is high when leader perceptions and employee perceptions are congruent and service climate is high. Contrary to what we propose, customer satisfaction is also at a relatively high level when leader perceptions and employee perceptions are incongruent. One explanation for this result could be that in our dataset, there is no big perceptual difference between leader perceptions (mean = 4.07) and employee perceptions (mean = 4.02). Even if divergent statistically (i.e., one is one standard deviation above mean and the other is one standard deviation below mean), perceptions of the two parties are still at a similar level. Therefore, for the stores that leader and employee perceptions are incongruent, as long as one group (e.g., leaders) has a high level of climate perceptions, the other group (e.g., employees) should have a relatively high level of perceptions as well, leading to high customer satisfaction. On the contrary, when both leader perceptions and employee perceptions are low, customer satisfaction could be low due to the positive effects of both leader perceptions and employee perceptions.

1.5.2 Practical Implications

This study has noteworthy practical implications. Albeit most of the time leaders do not have direct interaction with customers, leaders' service climate perceptions may still affect customer satisfaction. We find that both leaders' and employees' service climate perceptions contribute to customer satisfaction, and hence in addition to employee surveys, our finding points to the diagnostic value of leader surveys, as well as the importance of maintaining a high level of leader service climate perception.

1.6 LIMITATION AND FUTURE RESEARCH

We are mindful of the limitations of this paper. First, the results reported in this paper are only correlations but not causal relationships, this study is thus not without potential endogeneity problem. The literature on service climate or more generally speaking, on organizational climate, has been largely plagued by endogeneity. Most, if not all, of the extant studies report correlational results and use non-instrumental variable estimation, such as OLS or SEM. Although we attempt to address the endogeneity problem by using various instrumental variables, our proposed instruments are too weak to produce unbiased estimations. Future research is highly encouraged to find good instruments and replicate our findings with instrumental variable estimation, such as two-stage least squares with valid and strong instruments. Finding good instruments for service climate is thus becomes critical. Finding good instruments can benefit not only service climate research, but also research in other focused climates, such as diversity climate and justice climate, as well as molar climate. Finding good instruments can move forward the organizational climate literature by making causal inference regarding the effect of organizational climate and climates with specific foci on important outcomes.

Second, we use online customer reviews as customer satisfaction data. Although we have a very large customer sample size (N = 43,525) across four different websites, the online customer data is positively skewed and has potential self-selection bias. Our data shows that the customers who leave reviews are mostly satisfied with their dining experience so that they are more motivated to leave comments on the websites than other customers. This limitation in customer data can be potentially overcome in future research by using random customer sample and with survey questionnaire.

Third, our data come from a relatively small sample in restaurants in China. This may prevent us from generalizing our findings to other service settings in other cultures. Future research can replicate our findings in other service settings and in another culture.

Fourth, it would be interesting to examine the effect of perceptual congruence of service climate on different outcomes, such as sales performance and employee behaviors. Future research can also examine perceptual congruence between leaders and employees with regard to other types of climates, for example, procedural justice climate, safety climate and ethical climate. By doing so, we can gain a clearer understanding of the importance of managerial perspective with regard to different types of organizational climate.

Finally, with regard to the psychometric properties of the measures used in this paper, Schneider and colleagues' (1998) scale to measure service climate has been extensively used in the field, and has been shown to have satisfactory psychometric properties. However, we notice that this scale could be further modified because the items are sometimes double or even quadruple barreled. We suggest future research make the items more straightforward and simpler and stress one point in each item.

1.7 CONCLUSION

Including leaders as raters of service climate, this research shows that both leaders' and employees' perceptions of service climate are positively related to customer satisfaction. Results show that both leaders' service climate perceptions and employees' service climate perceptions influence customer satisfaction. Moreover, customer satisfaction is high when leader perceptions and employee perceptions are incongruent and when leader perceptions and employee perceptions are congruent and high. Customer satisfaction is low when leaders and employees have congruent perceptions and service climate is low. This research contributes to service climate research by pointing out the necessity of including leaders as raters of service climate and highlighting the possibly of using leader survey.

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Table 1.1 Means, Standard Deviations and Correlations

Variable	Mean	Std.	1	2	3	4	5	6	7
1. Customer Satisfaction	4.37	0.24	-						
2. Service Climate – Employees	4.02	0.37	0.26^{+}	-					
3. Service Climate – Leaders	4.07	0.42	0.24^{+}	0.74***	-				
4. Customer Contact Frequency	33.73	10.08	0.07	0.16	0.05	-			
5. Unit Size	54.95	39.43	-0.07	-0.15	-0.08	-0.32*	-		
6. Median income	10497.00	739.99	0.00	-0.03	-0.05	-0.10	0.51***	-	
7. Total Customer Respondents	837.02	1221.89	0.36**	-0.17	-0.15	-0.06	-0.06	-0.14	-

$N = 52$, except for service climate-leader, which has 51 stores. *** $p < .001$, ** $p < .01$, + $p < .1$

Table 1.2 Confirmatory Factor Analysis

	One Factor Model	Two Factor (Service Climate by Leaders and Employees) Model	Two Factor (Service Climate by Leaders and Employees) Model - Revised
SC_LE1	.73(.07)	.73(.07)	/
SC_LE2	.74(.07)	.80(.06)	.83(.05)
SC_LE3	.68(.08)	.70(.08)	/
SC_LE4	.72(.07)	.76(.07)	.75(.07)
SC_LE5	.81(.05)	.89(.04)	.90(.04)
SC_LE6	.67(.08)	.76(.06)	.80(.06)
SC_LE7	.74(.07)	.82(.05)	.80(.06)
SC_EM1	.76(.06)	.80(.06)	.81(.05)
SC_EM2	.81(.05)	.87(.04)	.87(.04)
SC_EM3	.79(.06)	.83(.05)	.82(.05)
SC_EM4	.75(.07)	.77(.06)	.79(.06)
SC_EM5	.78(.06)	.79(.06)	.76(.07)
SC_EM6	.73(.07)	.77(.06)	/
SC_EM7	.78(.06)	.83(.05)	.83(.05)
Model Fit indices			
χ2 with Swain	165.41***	115.84**	55.45
RMSEA	.17	.12	.09
CFI	.80	.90	.96

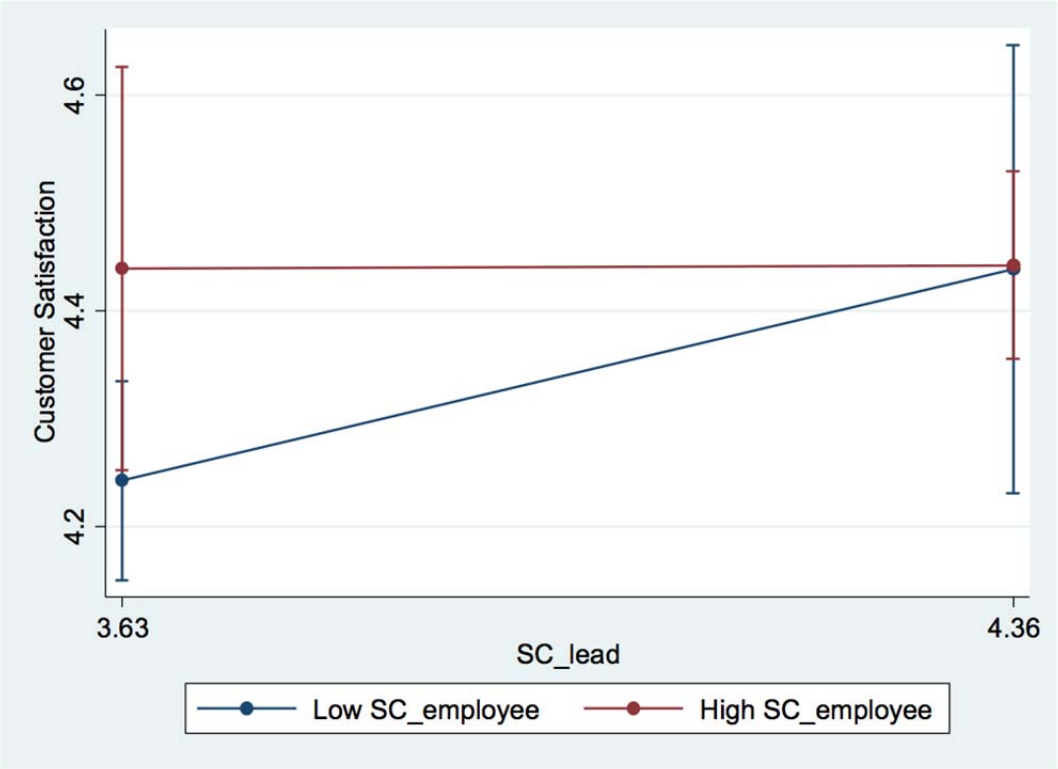
Note: Standardized factor loadings are presented, standard errors are in parentheses. All factor loadings are significant. SC = service climate

Table 1.3 Hypothesis Testing

	Customer Satisfaction
Controls	
Customer contact	-.00(.00)
Median income	.00(.00)
Number of customer respondents	.00(.00)**
Unit Size	-.00(.00)
Predictors	
SC_Leaders	1.39(.66)*
SC_Employees	1.34(.62)*
SC_Leaders * SC_Employees	-.31(.15)*
R square	.35

Note: SC = service climate. *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 1.1 Simple Slopes of Employee-Perceived Service Climate*Leader-Perceived Service Climate on Customer Satisfaction



1.9 Appendix A. Measures

Service Climate

1. How would you rate the job knowledge and skills of employees in your business to deliver superior quality work and service?

2. How would you rate efforts to measure and track the quality of the work and service in your business?

3. How would you rate the recognition and rewards employees receive for the delivery of superior work and service?

4. How would you rate the overall quality of service provided by your business?

5. How would you rate the leadership shown by management in your business in supporting the service quality effort?

6. How would you rate the effectiveness of our communications efforts to both employees and customers?

7. How would you rate the tools, technology, and other resources provided to employees to support the delivery of superior quality work and service?

1.10 Appendix B. Leader Personality as an Instrument Variable

First-stage Regressions

	SC_Employee	SC_Leader	SC_Employee * SC_Leader
Controls			
Customer Contact	.00(.01)	.00(.01)	.03(.05)
Unit size	.00(.00)	-.00(.00)	.00(.01)
Median Income	-.00(.00)	.00(.00)	-.00(.00)
Customer Respondent Number	-.00(.00)	-.00(.00)	-.00(.00)
Instruments			
Extraversion	2.65(1.55)	1.56(1.37)	17.24(10.89)
Agreeableness	2.05(1.81)	-.46(1.59)	5.98(12.68)
Conscientiousness	.30(2.49)	.68(2.20)	6.22(17.46)
Neuroticism	3.48(1.64)*	-.29(1.45)	12.89(11.53)
Openness	1.48(2.14)	-.70(1.89)	2.70(15.00)
Extraversion*Openness	-.81(.44)	-.45(.39)	-5.20(3.10)
Agreeableness*Openness	-.50(.53)	.13(.47)	-1.31(3.75)
Conscientiousness*Openness	-.05(.72)	-.20(.64)	-1.70(5.08)
Neuroticism*Openness	-1.00(.45)*	.03(.39)	-3.92(3.13)
Openness*Openness	1.01(.40)*	.40(.35)	6.10(2.79)*
F test	1.77	1.11	1.71

Note: Estimation coefficients are reported in the table, standard errors are in parentheses.

Instrumental variables (2SLS) regression

	Customer Satisfaction
Controls	
Customer Contact	-.00(.00)
Unit size	-.00(.00)
Median Income	.00(.00)
Customer Respondent Number	.00(.00)*
Predictors	
SC_Employee	-.19 (1.87)
SC_Leader	-.80(2.05)
SC_Employee*SC_Leader	.11(.45)

Note: * $p < .05$ ** $p < .01$ *** $p < .001$; Sargan chi2(7) = 5.15 (p = 0.64). Estimation coefficients are reported in the table, standard errors are in parentheses.

1.11 Appendix C. Leader Personality and Unit Size as Instrument Variables

First-stage Regressions

	SC_Employee	SC_Leader	SC_Employee * SC_Leader
Controls			
Customer Contact	.00(.01)	.00(.01)	.03(.05)
Median Income	-.00(.00)	.00(.00)	-.00(.00)
Customer Respondent Number	-.00(.00)	-.00(.00)	-.00(.00)
Instruments			
Extraversion	-.01(.57)	-.36(.45)	-1.37(3.86)
Agreeableness	.40(.53)	.19(.42)	2.45(3.60)
Conscientiousness	-.31(.46)	.18(.36)	-.59(3.08)
Neuroticism	-.31(.38)	-.04(.30)	-1.49(2.53)
Openness	.65(.50)	-.07(.39)	2.44 (3.35)
Unit Size	.00(.03)	-.02(.02)	-.04(.20)
Extraversion*Unit Size	.00(.01)	.01(.01)	.04(.08)
Agreeableness*Unit Size	-.00(.01)	-.01(.01)	-.04(.07)
Conscientiousness*Unit Size	.00(.01)	-.01(.01)	-.01(.05)
Neuroticism*Unit Size	.00(.01)	-.04(.30)	-.01(.05)
Openness*Unit Size	-.00(.01)	-.07(.39)	.03(.06)
F test	.89	1.11	1.11

Note: Coefficients are reported in the table, standard errors are in parentheses.

Instrumental variables (2SLS) regression

	Customer Satisfaction
Controls	
Customer Contact	.00(.00)
Median Income	.00(.00)
Customer Respondent Number	.00(.00)*
Predictors	
SC_Employee	2.03 (1.83)
SC_Leader	2.33(1.82)
SC_Employee*SC_Leader	-.52(.43)

Note: * $p < .05$ ** $p < .01$ *** $p < .001$; Sargan chi2(8) = 5.57 (p = 0.70). Coefficients are reported in the table, standard errors are in parentheses.

1.12 Appendix D. Unit Size and Median Income as Instrument Variables

First-stage Regressions

	SC_Employee	SC_Leader	SC_Employee * SC_Leader
Controls			
Customer Contact	.00(.01)	.00(.01)	.03(.05)
Customer Respondent Number	-.00(.00)	-.00(.00)	-.00(.00)
Instruments			
Median Income	.00(.00)	-.00(.00)	.00(.00)
Unit Size	.02(.02)	-.01(.01)	.04(.12)
Median Income*Unit Size	.00(.00)	.00(.00)	-.00(.00)
F test	.67	.82	.65

Note: Coefficients are reported in the table, standard errors are in parentheses.

Instrumental variables (2SLS) regression

	Customer Satisfaction
Controls	
Customer Contact	.00(.01)
Customer Respondent Number	.00(.00)
Predictors	
SC_Employee	3.46(4.88)
SC_Leader	3.94(5.15)
SC_Employee*SC_Leader	-.86(1.18)

Note: * $p < .05$ ** $p < .01$ *** $p < .001$. Note: Coefficients are reported in the table, standard errors are in parentheses.

CHAPTER 2. IS SERVICE A REMEDY FOR UNSATISFACTORY PRODUCT? INTERACTION BETWEEN SERVICE CLIMATE AND PRODUCT QUALITY CLIMATE ON CUSTOMER SATISFACTION

2.1 INTRODUCTION

Founded in 1994, Haidilao is a restaurant chain that specializes in Sichuan hot pot (i.e., Chinese fondue) in China. In recent years, Haidilao has become one of the most popular hot pot brands in China: the daily table turnover rate is seven on average, the annual sales of a flagship restaurant is RMB 50 million, and annual customer traffic per retail store reaches 20 million (sina, 2011). Since 2012, the business of Haidilao has spread to Singapore, Korea and the United States. Haidilao becomes an internationally renowned restaurant chain.

A particularly interesting phenomenon of Haidilao is that, during peak hours, there is always a long line of customers waiting for tables in front of the restaurants, and people seem to enjoy the long waiting time. After careful observation, one clear reason would become apparent: waiting for tables at Haidilao is a process of entertainment and joy with free services. They offer customers fruit, nuts, chips, and different kinds of drinks. They provide customers the opportunity to play poker and Chinese checkers if customers come in groups. They even help women paint their nails and offer men shoeshine service. By doing so, Haidilao retains most if not all its customers.

During dining, the service provided by Haidilao staff goes even further. They provide hairpins to the ladies to avoid their hair getting soiled by spilled soup, they offer customers cellphone cases to avoid sauce dropping on phones, and they offer customers aprons to make sure their clothes remain clean. Sometimes the waitresses act as temporary babysitters, feed the children and play with them. Customers who happen to celebrate a birthday receive birthday gifts. Most restaurants prepare opera performances for the customers to enjoy during their meals. These

meticulous and innovative services make customers feel at home, addictive to the dining experience, and eager to come back.

If one looks at the online customer reviews, one would be astonished by the compliments for Haidilao's customer service. On dianping.com, one of the largest and most widely-used customer review websites in China, comments like the following are frequently seen (collected in November and December, 2016):

"There is no doubt about Haidilao's service. A lot of restaurants learn from Haidilao, but not a single one can surpass it. It's the best!"

"I go there alone. Customer service is super. The waitress keeps asking me if I need anything. She even puts a big doll in front of me to keep me company during the meal. It is really sweet."

"Very satisfied. The service at Haidilao is always very good, but this time it was outstanding. The waitress noticed I was pregnant and, very thoughtfully, she brought me a cushion to keep me from getting tired. After dining, she prepared a mommy-to-be gift for me. It is really heart-warming and rare! Thumbs up one hundred times!"

Due to its superior customer service, Haidilao's restaurants in big cities such as Beijing, Shanghai and Xi'an are consistently ranked top two in customer service on dianping.com. However, it is noteworthy to mention that although most customers are very satisfied with their dining experience and provide very high overall ratings, when it comes to food and taste, customers are sparing with their compliments. The following comments are rather common:

"I feel the taste is okay, not outstanding, at a medium level. The meat is good, and the taste is very nice. Homemade source, super. Soup is okay, nothing special, but okay."

"The taste is not bad, but it is not as good as I imagined."

"The service at Haidilao has improved a lot, and the waitresses are very friendly and warm-hearted. Everybody smiles. I give full grades to their service… In terms of taste, recently I prefer Chongqing style and Beijing old-style hotpots. I feel that except for the service, Haidilao does not have any big advantages."

From the customer reviews, customers react quite differently to the service and food at Haidilao—they are extremely happy with the service but only feel somewhat satisfied with the food. However, in spite of such disparity, customers still feel very happy in general and would like to return. Some customers even mention that it really doesn't matter what they eat at Haidilao, it is the customer service that makes them come back.

The case of Haidilao indicates that product quality and service quality interplay when influencing customer satisfaction, more specifically, when a product quality does not stand out, increasing service quality can compensate for it. In academia, researchers have also shown great interest in studying the relationship between product quality and service quality with customer satisfaction simultaneously. For example, researchers are interested in studying the infusion of service into manufacturing (e.g., Bowen, Siehl and Schneider, 1989; Gebauer et al., 2012), or the relative importance of the two factors (e.g., Sulek and Hensley, 2004; Kim et al., 2009; Saab Andaleeb and Conway, 2006). However, the interactive influence of product quality and service quality, especially their complementarity, has not received sufficient research attention. Therefore, this paper aims to advance the literature from this perspecitve. Instead of studying service and product quality from the perceptions of customers, we take another perspective and investigate them from the perceptions of employees, that is, climate for service and climate for product quality. We endeavor to answer the following research question: Can service quality and product quality compensate for each other to predict customer satisfaction?

This paper makes several contributions to existing research. First, this research studies product quality and service quality from the perceptions of employees instead of customers. By doing so, it links employee perceptions with customer satisfaction and hence underscores the ne-cessity of using employees as internal judges of product quality and service quality. Second, this paper ex-amines the joint effects of service climate and product quality climate on customer satis-faction, thus it answers the calls for research on multiple organizational climates (e.g., Bowen & Schnei-der, 2014). Third, practically speaking, this research points to the possibility to utilize ser-vice quality to compensate for food quality.

The rest of this paper is organized as follows: we first present the theoretical argument and hypothesis development. We then test the hypothesis with a sample of restaurants in China. Fi-nally, we discuss the theoretical and practical implications of the results.

2.2 THEORY AND HYPOTHESIS DEVEOPMENT

2.2.1 Service Quality and Product Quality

"Goods-producing and services-producing firms are not dichotomies." (Bowen, Siehl and Schneider, 1989) Service firms may resemble manufacturing firms in their outputs, and manufacturing firms sometimes compete through service (Bowen, Siehl and Schneider, 1989; Gebauer et al., 2012). The interesting phenomenon that firms try to mix products and services to gain competitiveness has inspired much scientific research. For example, Bowen, Siehl and Schneider (1989) propose a "service-oriented manufacturing configuration" that infuses customer service in manufacturing firms. Similar research topics such as transitioning from products to services, service business development in manufacturing firms, and servitization have also re-ceived considerable research attentions (Gebauer, Edvardsson, Gustafsson, & Witell, 2010; Anti-oco, Moenaert, Lindgreen, & Wetzels, 2008; Neely, 2008).

One typical setting that suits the "service-oriented manufacturing configuration" is the res-

taurant. In the context of a restaurant, product (i.e., food) and service are irreplaceable but also intertwined. Together, food and service constitute a customer's total dining experience. Below, we use the restaurant setting as an example and provide our arguments for the interplay between product quality and service quality.

A large proportion of past research identifies food quality and service quality as main dimensions of customer satisfaction in restaurant. For example, Kim and colleagues (2009) develop the Institutional DINESERV instrument, which includes such dimensions as food quality, service quality, atmosphere, convenience, price and value (Kim, Ng, & Kim, 2009). They find that food quality and service quality, compared to other dimensions, have the largest correlations with customer satisfaction. Berry and colleagues (2002) propose three main factors that constitute the customer dining experience: functionality—the quality of food; humanics—the emotional reactions of customers that are triggered by people such as behaviors of service employees; and mechanics—the emotional reactions of customers that are triggered by factors such as dining environment and atmosphere. Johns, Tyas, Ingold and Hopkinson (1996) add the food quality factor to the SERVQUAL measurement instrument and find that items concerned with food and service staff are the only common elements of customer meal experience across ten foodservice outlets.

Furthermore, some studies identify food quality and service quality as two key predictors of customer satisfaction (e.g., Ha & Jang, 2010; Hyun, 2010; Namkung & Jang, 2007; Sulek & Hensley, 2004; Pettijohn et al., 1997; Ryu and Han, 2010), for example, in upscale restaurants, full-service restaurants, fast food restaurants, Chinese restaurants, and university dining facilities (Dube et al., 1994; Sulek and Hensley, 2004; Pettijohn et al., 1997; Qu, 1997; Kim et al., 2006; 2009) as well as at an aggregate market level, for adventurous food seekers and at full-service restaurants (Yuksel and Yuksel, 2002; Saab Andaleeb and Conway, 2006).

In summary, extant research shows both food quality and service quality play critical roles in

determining customer satisfaction, either as main dimensions or as predictors of customer satisfaction. Following this line of research, we also look at these two factors when determining customer satisfaction. It is noteworthy that we look at service quality and food quality from the perspective of employees, that is, climate for service and climate for food quality. More specifically, we are interested in their interplay when predicting customer satisfaction.

2.2.2 Climate for Service and Climate for Food Quality

To better infuse service into manufacturing, Schneider and colleagues (1989) advocate to create a climate for service in manufacturing firms as one of organizational strategies. Service climate refers to employees' shared perceptions of policies, practices and procedures that they experience and the service behaviors they observe that are rewarded, supported, and expected with regard to service quality (Bowen & Schneider, 2014). Prior research consistently shows a positive correlation between service climate and customer satisfaction (e.g., Dietz et al., 2004; Bowen and Schneider, 2014). The logic is that when the service staff perceive a positive service climate in restaurants, they understand that high quality service is expected, supported and rewarded. They then try to meet such expectations by delivering excellent service and performing towards this expectation. As a result, customers are more likely to be happy with the high quality service they receive, and in turn are satisfied with their total dining experience.

Because prior research shows that both food quality and service quality are critical factors for determining customer satisfaction (e.g., Namkung & Jang, 2007; Ryu and Han, 2010), focusing only on service climate may not be the most productive way to producing a high level of customer satisfaction. Accordingly, it is necessary to build another climate, that is, climate for food quality. Simultaneously exploring service climate and food quality climate enables us to understanding how they interactively influence customer satisfaction.

Different from service climate which focuses on service quality, a climate for food quality focus-

es on the quality of food. We define climate for food quality as employees' shared perceptions of focused policies, practices and procedures that are rewarded, supported, and expected with regard to food quality. In restaurants with a positive food quality climate, employees perceive that high food quality should be ensured. As a result, the behaviors of staff, especially those in the kitchen and logistic departments, are likely to follow in response to this climate. Employees endeavor to make sure the food is safely transported, freshly kept, appropriately cleaned, and properly cooked. When customers are served high quality and tasty food, they tend to be satisfied and happy with their choice and the performance of the restaurant.

Organizational climate research suggests that multiple facet-specific climates exist simultaneously in an organization (Kuenzi and Schmink, 2009), and the interplay between multiple organizational climates changes the way they influence the outcomes alone. Following this line of thought, we propose that service climate and food quality climate interactively influence customer satisfaction.

2.2.3 Interaction between Service Climate and Food Quality Climate

We propose an interactive effect between service climate and product quality climate on customer satisfaction. More specifically, the effect of service climate on customer satisfaction depends on the level of food quality climate such that the effect of service climate is more salient when food quality climate is low than when food quality is high. Past research indicates that food quality has stronger correlation with customer satisfaction compared to that of service quality (e.g., Sulek and Hensley, 2004; Kim et al., 2009), and food quality is the primary driving factor for customer loyalty and intention to return (Clark and Wood, 1992; Susskind and Chan, 2000; Mattila, 2001). For example, Saab Andaleeb and Conway (2006) argue that the primary reason people go to restaurants is for the meal. As long as customers get the food they want, they are satisfied (Saab Andaleeb and Conway, 2006). Following this line of thought, when food quality is

high, its influence on customer satisfaction would be so dominant that the influence of service climate may not to be very salient.

In contrast, when food quality climate is unsatisfactory, in order to remain competitive, enhancing service quality could compensate for food quality to attract customers. Service occurs along the whole process in customer dining experience: from waiting in queues outside the restaurants, to entering the restaurant and ordering, to dining and paying for the bill, and to leaving the restaurant. The customer service during these phases not only influences customer satisfaction during dining, it also plays a role in creating customer pre-dining mood and post-dining feeling with regard to the restaurant's performance. When food quality is mediocre, high quality service delivered before, during and after dining creates an exceptional, delightful and memorable service experience, which can make customers feel welcome, special and satisfied. The influence of service quality on customer satisfaction is thus more salient when food quality climate is low compared to when it is high.

Taken in to account the above arguments, we propose:

H1. Service climate and food quality climate have an interactive effect on customer satisfaction, such that the effect of service climate on customer satisfaction is stronger when food quality climate is low than when it is high.

2.2.4 Competing Hypothesis

There could also be another possibility regarding the interactive effect between service climate and product quality climate, that is, the effect of service climate on customer satisfaction depends on the level of food quality climate such that the effect of service climate is more salient when food quality climate is high than when it is low. Gronroos (1984) in his seminal paper has uses technical quality to refer to what consumers receives as result of the interaction with a restaurant, that is, food quality, and he uses functional quality to refer to how customers get the

technical outcome, that is, service quality. He suggests a complementary relationship between food quality and service quality. More specifically, the influence of service quality on customer satisfaction is especially salient when food quality is satisfactory. This is more noticeable when food quality is very similar among firms in the marketplace and is difficult to differentiate (Gronroos, 1984). With data from Swedish service firm executives, Gronroos finds that service quality is considered very important, and is so important that a high level service quality may compensate for technical quality. 91.3% of respondents agree that "contact personnel's way of handling the contacts with the customers, if it is customer-oriented and service-minded, will compensate for temporary problems with the technical quality of the service." Gronroos collects the data from executives, thus both food quality and service quality are from internal employees' perspective.

Following Gronroos's arguments and finding, we think the interplay between food quality climate and service climate on customer satisfaction is similar, such that the influence of service climate on customer satisfaction is more salient when food quality climate is satisfactory than when it not satisfactory. When food quality is high, customers' expectations for food are met and they are more likely to pay attention to other factors such as service quality, such as how service is delivered to them, whether the service personnel are polite, and whether product is served fast. On the basis of high food quality, high quality service makes happy customers even happier. On the contrary, when food quality is at a lower level, we expect that customers would be unsatisfied regardless of the level of service quality. Prior research indicates that customer satisfaction depends on customer expectation and actual evaluation (Anderson & Sullivan, 1993; Oliver, 1980). When actual experience is higher than expectation (i.e., positive confirmation), customers are satisfied. Otherwise (i.e., negative confirmation), they tend to be unsatisfied. Research shows that customer satisfaction is more sensitive to negative confirmation than positive confirmation (Anderson & Sullivan, 1993; Mittal, Ross & Baldasare, 1998). That being said, low food quality

hurts customers more than high service quality pleases customers. Therefore, customers who receive low food quality would be so unsatisfied regardless of the level of service quality.

Taken together, we propose the first hypothesis,

H2. Service climate and food quality climate have an interactive effect on customer satisfaction, such that the effect of service climate on customer satisfaction is stronger when food quality climate is high than when it is low.

2.3 METHOD

2.3.1 Sample

Data came from 52 full-service restaurants in China. The employee and customer samples in this paper were the same as those in Paper 1.

Particularly, 589 employees and 174 leaders evaluated service climate and food quality climate using a survey in November 2015. The final ratings for service climate and food quality climate were calculated by averaging the ratings of employees and leaders.

Due to pragmatic reason, customer satisfaction data were collected from online evaluations from four large customer review websites (i.e., www.dianping.com, www.ctrip.com, www.meituan.com, www.class01.com). Only the customer reviews which were posted after we collected the employee data (i.e., November 2015) were included in our sample. The advantage of using online customer sample was its availability and quickness. The disadvantage would be the risk that the sample had a self-selection bias and might not represent the whole population. The mean of customer satisfaction was 4.37. The standard error of the mean was .03, with a 95% confidence interval as [4.30, 4.43]. A skewness test showed that our customer data was positively skewed, χ^2 (2) = 24.75 ($p < .001$). Although we had a large sample size in our dataset, that is, a total of 43,525 customers provided their evaluations, with a per-store average of 837.02 (*s.d.* = 1221.89), our data clustered at the high end. We will discuss this problem in detail in limitation.

2.3.2 Measures

Service Climate. Service climate was measured with the same instrument as that in Paper 1. It was assessed with a seven-item measure developed by Schneider, White and Paul (1998). A sample item was "How would you rate the job knowledge and skills of employees in your restaurant to deliver superior quality work and service?" The items were assessed using a 5-point Likert scale, ranging from 1 "poor" to 5 "excellent." This scale was used to measure both leader and employee perceptions of service climate.

Food Quality Climate. Food quality climate was measured with a six-item instrument developed by Ahire, Golhar and Waller (1996). We adapted the measure for the restaurant setting. A sample item was "We have clear food quality goals identified by our manager." The items were assessed using a 5-point Likert scale, ranging from 1 "strongly disagree" to 5 "strongly agree." Cronbach's alpha for the measure of food quality climate was .93. ICC(1) was .42 and ICC(2) was .81. The median value of r_{wg} was .95.

Customer Satisfaction. Customer satisfaction data were obtained the same way as those in Paper 1. Please see Paper 1 for details.

Control Variables. As in Paper 1, we controlled for unit size, median income, the frequency of customer contact, and the total number of customer respondents because all of these variables were likely to be correlated with customer satisfaction in existing research.

2.3.3 Estimation Strategy

We first used the five factors of leader personality as instrumental variables for service climate and food quality climate. Past research has shown that endogeneity bias could be purged by using stable leader individual differences like personality (Antonakis & House, 2014). Because organizational climate was consistently found to be created by leaders, using leader personality as an instrument for service climate and food quality climate was thus possible.

Leader personality was measured with the 44-item Big Five Inventory (John & Srivastava, 1999), including openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. Sample items included "I see myself as someone who is talkative" and "I see myself as someone who is outgoing, sociable." Cronbach's alphas for openness to experience, extraversion, agreeableness, conscientiousness, and neuroticism were .85, .74, .77, .74 and .84, respectively.

We used the five factors of personality as instruments for service climate and food quality climate, and used the product of openness and other factors as instruments for the interaction term. The validity of these instruments was examined. First, we examined first-stage F tests. The *F*-statistics for leader perceptions of service climate, and employee perceptions of service climate and their interaction were 1.69 ($p > .05$), 1.37 ($p > .05$), and 1.85 ($p > .05$). These F-statistics were far lower than the rule of thumb of 10 (Staiger and Stock, 1997). Our instruments were thus very weak. Second, we conducted a Sargan over-identification test. The Sargan statistic ($\chi 2\ (3) = 8.48$, $p > .05$) showed that our instruments were not correlated with structural error term. The second requirement was met.

Because leader personality as an instrument was too weak to be valid, we tried other variables as instruments. We then used the five factors of leader personality and unit size as instruments for leader-perceived and employee perceived service climate. The interaction of leader perceptions of service climate and employee perceptions of service climate was instrumented with the product of the five factors of personality and unit size. The *F*-statistics were even lower. The *F*-statistics for leader perceptions of service climate, and employee perceptions of service climate and their interaction were 0.91 ($p > .05$), 0.77 ($p > .05$), and 0.91 ($p > .05$). The Sargan statistic was $\chi 2\ (3) = 4.72$, $p > .05$. Therefore, these instruments again were not strong enough.

We also tried to use unit size and median income and their product as instruments. The *F*-statistics for leader perceptions of service climate, and employee perceptions of service climate and their interaction were 0.51 ($p > .05$), 0.44 ($p > .05$), and 0.56 ($p > .05$), which were too low to be above 10. Therefore, we could not use them as instruments.

Detailed results of all the weak instruments we tried were shown in Appendix B-D. As in Paper 1, we decided to report the ordinary least squares (OLS) results instead of instrumental variable (IV) estimation, because IV estimation with very weak instruments can be more biased than OLS (Stock, Wright, and Yogo, 2002). The level of analysis was at the restaurant level.

Below, I report the OLS results.

2.4 RESULTS

2.4.1 Descriptive Statistics

Table 2.1 presents the means and standard deviations for, and the correlations among the variables.

Insert Table 2.1 about here

2.4.2 Measurement Model

We conducted a confirmatory factor analysis (CFA) to assess the measurement model at the restaurant level. We first specified a one-factor model, with all items of service climate and food quality climate on the factors. The model fit indices were not satisfactory: χ^2 (65) = 237.12, $p <$ .001; RMSEA = .23; CFI = .76, chi square with Swain correction (Antonakis & Bastardoz, 2013): χ^2 (65) = 212.38s, $p < .001$. We then specified two factors, that is, service climate and food quality climate with items loaded on their corresponding factors. Using the Swain correction, the model fit indices were not very satisfactory: χ^2 (64) = 168.74, $p < .001$; RMSEA = .18; CFI = .85.

Chi square with swain correction: χ^2 (64) = 151.05, $p < .001$. I then deleted one item of service climate and two items of food quality climate which had comparably low factor loadings on their respective factors. The new model produced very good model fit indices: χ^2 (34) with swain correction was 46.21 ($p > .05$); RMSEA = .10; CFI = .97. Therefore, I used the more parsimonious two-factor model for hypothesis testing. We were aware that selecting items and validating the measurement model to the same sample had the potential problem of capitalization on chance (MacCallum et al., 1992). This might lead to the modified measurement model fitting our sample but might not generalize to other samples (MacCallum et al., 1992).

Insert Table 2.2 about here

2.4.3 Hypothesis Testing

We proposed that service climate and food quality climate had an interactive effect on customer satisfaction. Table 2.3 presents the results. The results showed a significant interaction between service climate and food quality climate ($\beta = -.45$, $p < .05$). Following the procedures of Aiken and West (1991), we probed the interaction by using one standard deviation below and above the mean of service climate and food quality climate. Hypothesis 1 proposes that service climate and food quality climate have an interactive effect on customer satisfaction, such that the effect of service climate on customer satisfaction is stronger when food quality climate is low than when it is high. Hypothesis 2 proposes that the effect of service climate on customer satisfaction is stronger when food quality climate is high than when it is low. Figure 2.1 shows the simple slopes. The effect of service climate on customer satisfaction was positive and approaching significant when food quality was at a low level ($r = .33$, $p = .06$), and the effect was not sig-

nificant when food quality was at a high level (r= .01, p = .96). Therefore, our results supported Hypothesis 1, but not Hypothesis 2.

The R square of the model is .21. A bootstrapping of the R square yields a R square of .21 with standard error of .12 and 95% confidence interval of [-.01, .44], which included zero, meaning that the R-square was not significant. Monte Carlo simulation showed that noise could generate an R-square of .13, which fell into the confidence interval, thus noise explained some variance of our dependent variable in our model.

Insert Table 2.3 about here

Insert Figure 2.1 about here

2.5 DISCUSSION

Contributing to the organizational climate and service climate literature, this study investigates the interplay between service climate and product quality climate on customer satisfaction. Using the restaurant industry as an example, we examined the interaction between service climate and food quality climate using data from 52 restaurants in China. The results support our hypothesis and reveal that service climate can compensate for low food quality climate to influence customer satisfaction. The effect of service climate on customer satisfaction is more salient when food quality climate is low than when it is high. Our results suggest that customer service can act as a remedy for poor product quality to enhance customer satisfaction. This study makes several contributions to both theory and practice.

2.5.1 Theoretical Contribution

First, this research studies two most important factors of customer satisfaction, that is, product quality and service quality. Saad Andeleeb and Conway (2006) argue that customer satisfaction is a consumption-related fulfillment provided by a product or service feature, or the product or service itself. Our results support their assentation that customer satisfaction in the full service restaurant industry is a mixture of fulfillment of service and product features or themselves. Our findings show that both service quality and product quality (from employee perspective) play significant roles in determining customer satisfaction.

Second, we examine the interactive effect of product quality and service quality from employees' perspective. Our findings support one of our competing hypotheses, that is the effect of service quality on customer satisfaction is stronger when product quality is low than when it is high. That is, service quality is more likely to stand out when product quality is unsatisfactory. As Gronroos put, "…functional quality (service quality), in fact, seems to be a very important dimension of the perceived service. In some cases, it is more important than the technical quality dimension." (Gronoos, 1984, p. 42) In the current research, product quality is not a distinguishing factor for customer dinning experience, service can make up for it..

Although the hypothesis is supported, our results show that when service climate is high, customer satisfaction is higher for a low level of food quality climate than a high level of food quality climate. This result is a bit surprising. The reason might be that we had a rather small sample size so that we might not have enough power to test the interaction. Another reason could be that we use data from online reviews. Although we have a large enough sample size, there could be a potential self-selection problem of the customer sample (Li and Hitt, 2004), and lead to skewness of the customer data. Future research is encouraged to replicate the results of this study with a larger sample and collect both employee and customer data with questionnaire.

Third, this study investigates service quality and product quality from the perspective of employees instead of that of customers. By doing so, it establishes the linkage between employee surveys and online customer reviews and hence indicates that employees can be good judges of service quality and product quality. Furthermore, by responding to the calls to study multiple climates (e.g., Bowen and Schneider, 2014; Kuenzi and Schminke, 2009), this study examines the co-existence of service climate and product quality climate. This research is among the first few to demonstrate that the co-existence of multiple climates changes the way organizational climate influences corresponding outcomes alone (see also Myer, Thoroughgood, & Mohammed, 2016; Jiang, Hu, Hong, Liao, & Liu, 2016; McKay, Avery, Liao, & Morris, 2011). Future research is encouraged to explore the interplay between other types of climates and examine their interaction on important outcomes.

Fourth, situated in the service climate literature, this study identifies product quality climate as a boundary condition for the relationship between service climate and customer satisfaction. Prior research has identified several boundary conditions for service climate, such as customer contact frequency, service intangibility, and service employee interdependence (Dietz, Pugh and Wiley, 2004; Mayer, Ehrhart and Schneider, 2009). This study adds to this body of research and helps us gain a richer understanding of the contingencies in the effects of service climate. As Mayer and colleagues put it, "one should not expect a high level of service climate to be equally effective in all service contexts, and thus it is important to understand when service climate matters most (and least)" (Mayer, Ehrhart and Schneider, 2009, p. 1034). From the results of this paper, it can be seen that for restaurants, the association between service climate and customer satisfaction is particularly pronounced when food quality is not high.

2.5.2 Practical Implications

This study offers practical implications for organizations that deliver both products and service in general. Even though product quality is decisive for customers, focusing only on product quality is generally not sufficient, especially when it is difficult to improve the quality of product. Practitioners need to find alternative ways to remain competitive in the industry. More attention should be paid to improving and maintaining a high level of service quality. Going back to the case of Haidilao, its CEO Zhang Yong used to mention that "if the customers have a good time during dining, they are happy with the taste; if the customers feel that the waitresses have poor service and bad attitudes, they would say the taste is bad." Zhang Yong's conclusion that "high quality service can complement bad taste" is well demonstrated in the success of Haidilao as well as the in the findings from the current field study. Therefore, practitioners should consider creating and maintaining a positive service climate as an auxiliary approach to attract and retain customers, especially when their product quality is hard to improve or to be outstanding in comparison to their competitors in the industry.

2.6 LIMITATIONS AND FUTURE RESEARCH

Because we use the same dataset as that in Paper 1, these two papers share their limitations. First, the results reported in this paper are only correlations but not causal relationships. This study is thus endogeneity prone. Although we attempt to address the endogeneity problem by using various instrumental variables, our proposed instruments are too weak to produce unbiased estimations. Due to the endogeneity problem, we are unable to make causal inference from our results. Future research is highly encouraged to find strong instruments for organizational climate. By doing so, we can potentially move forward the organizational climate literature and draw causal inference.

Second, we use online customer reviews as customer satisfaction data. Although we have a very large customer sample size (N = 43,525) across four different websites, the online customer data has potential self-selection bias. Those customers who leave reviews may be very happy about their dining experience so that they are more motivated to leave comments on the websites than other customers. Prior research shows that online customer reviews are mostly positively biased (Resnick and Zeckhauser, 2002; Chevalier and Mayzlin, 2006). Similarly, a skewness test shows that our data are positively biased ($\chi^2 = 27.98$, $p < .001$). In order to avoid this problem and have normalized customer data, future research is encouraged to use survey to collect data from random customers.

Third, the field data for this study is from full service restaurants in China. Therefore, the findings and implications may be relevant particularly for this particular setting. Future research could replicate this study with a different sample from other countries or cultures.

Fourth, although this study is inspired by the case of Haidilao, we did not conduct an in-depth case study of this chain brand in this paper. It would be interesting to combine a case study of Haidilao and a field study in future research to further investigate the complementary role of service climate for product quality climate.

Fifth, this study focuses only on service and food as two main factors of customer satisfaction in restaurants. However, there are other important factors such as environment and waiting time that also play significant roles. Future research could incorporate some of these factors and examine whether they have complementary or competing effects on customer outcomes when examined simultaneously.

2.7 CONCLUSION

This paper examines the interplay between service climate and product quality climate on customer satisfaction. Using data from employees, managers, customers and census from 52 res-

taurants in China, we now can answer the research question laid out at the beginning of this paper: High service quality can compensate for unsatisfactory to product quality produce a high level of customer satisfaction. This paper advances research in multiple climates, service climate as well as service research.

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Table 2.1 Means, Standard Deviations and Correlations

Variable	Mean	Std.	1	2	3	4	5	6
1. Customer Satisfaction	4.34	0.25	-					
2. Service Climate	4.04	0.37	0.21	-				
3. Food Quality Climate	4.14	0.37	0.21	0.75***	-			
4. Unit Size	54.95	39.43	0.03	0.00	-0.16	-		
5. Customer Contact	33.73	10.08	0.00	0.15	0.06	-0.07	-	
6. Median Income	10497.00	739.00	-0.00	-0.04	-0.06	0.51	-0.10	-
7. Total Customer Respondents	837.02	1221.89	0.25+	-0.16	-0.13	-0.06	0.06	-0.14

$N = 52$. *** $p < .001$, * $p < .05$, + $p < .1$

Table 2.2 Confirmatory Factory Analysis

	One Factor Model	Two Factor (Service Climate and Food Quality Climate) Model	Two Factor (Service Climate and Food Quality Climate) Model - Revised
SC1	.85(.04)	.84(.04)	.86(.04)
SC2	.83(.05)	.87(.04)	.87(.04)
SC3	.83(.05)	.86(.04)	.88(.04)
SC4	.78(.06)	.82(.05)	.83(.05)
SC5	.82(.05)	.86(.04)	.84(.05)
SC6	.76(.06)	.79(.06)	/
SC7	.84(.05)	.88(.04)	.88(.04)
FQC1	.74(.07)	.80(.05)	/
FQC2	.72(.07)	.82(.05)	.82(.05)
FQC3	.73(.07)	.75(.07)	/
FQC4	.88(.04)	.90(.03)	.88(.04)
FQC5	.81(.05)	.88(.04)	.89(.04)
FQC6	.83(.05)	.89 (.03)	.92(.03)
Model Fit indices			
χ2 with Swain	212.38***	151.05**	46.21
RMSEA	.23	.18	.10
CFI	.76	.85	.97

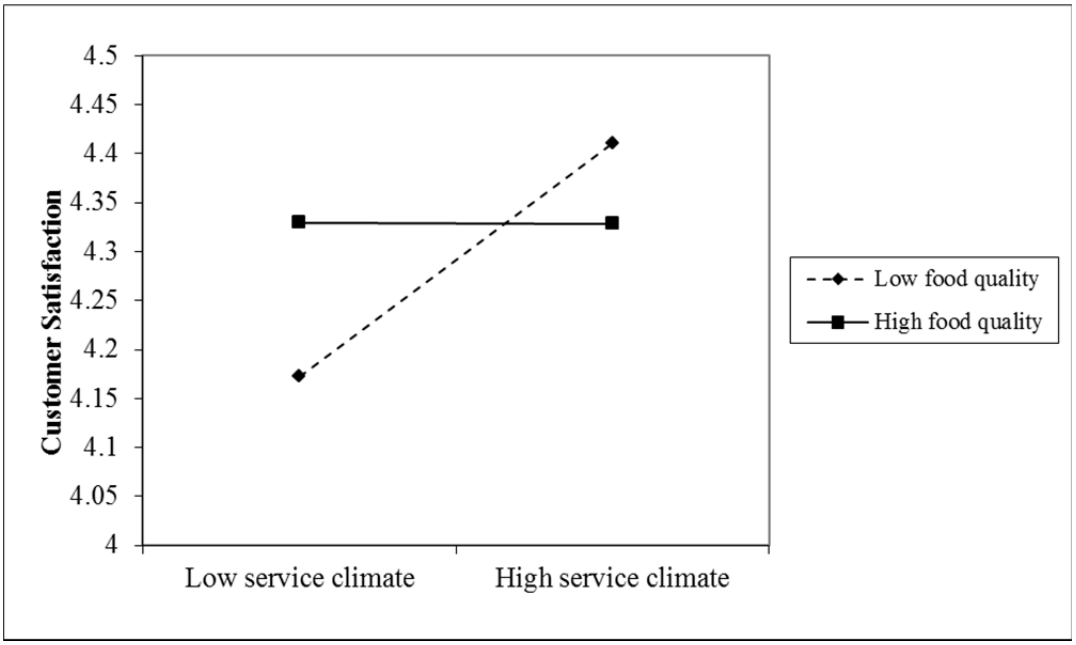
Note: Standardized factor loadings are reported as entries, and standard errors are reported in parentheses.

Table 2.3 Hypothesis Testing

	Customer Satisfaction
Control variables	
Customer Contact	.01(.02)
Unit Size	.00(.00)
Median income	.00(.00)
Total Customer Respondents	.00(.00)+
Predictors	
Service climate	1.87(.89)*
Food quality climate	2.05(.96)*
Service climate*Food quality climate	-.45(.22)*
R square	.21

Note: ** $p < .01$, * $p < .05$, + $p < .1$

Figure 2.1 Service Climate X Food Quality Climate on Customer Satisfaction



2.9 Appendix A. Measures

Service Climate

1. How would you rate the job knowledge and skills of employees in your business to deliver superior quality work and service?

2. How would you rate efforts to measure and track the quality of the work and service in your business?

3. How would you rate the recognition and rewards employees receive for the delivery of superior work and service?

4. How would you rate the overall quality of service provided by your business?

5. How would you rate the leadership shown by management in your business in supporting the service quality effort?

6. How would you rate the effectiveness of our communications efforts to both employees and customers?

7. How would you rate the tools, technology, and other resources provided to employees to support the delivery of superior quality work and service?

Food Quality Climate

1. My restaurant views food quality as being more important than cost.

2. My restaurant views food quality as being more important than meeting production schedules.

3. Our performance evaluation by our manager depends heavily on food quality.

4. My manager allocates adequate resources toward efforts to improve food quality.

5. We have clear food quality goals identified by our manager.

6. At company-wide meetings, top level managers often discuss the importance of food quality.

2.10 Appendix B. Leader Personality as an Instrument Variable

First-stage Regressions

	Food Quality Climate	Service Climate	Service Climate * Food Quality Climate
Controls			
Customer Contact	.01(.01)	.00(.01)	.06(.05)
Unit size	-.00(.00)	.00(.00)	.00(.01)
Median Income	-.00(.00)	-.00(.00)	-.00(.00)
Customer Respondent Number	-.00(.00)	-.00(.00)	-.00(.00)
Instruments			
Extraversion	3.05(1.31)*	2.18(1.40)	21.47(10.16)*
Agreeableness	2.43(1.52)	.77(1.63)	12.70(11.80)
Conscientiousness	-.47(2.10)	.16(2.25)	.51(16.26)
Neuroticism	.88(1.40)	1.42(1.49)	9.41(10.82)
Openness	.51(1.79)	.17(1.91)	2.44(13.84)
Extraversion*Openness	-.90(.37)*	-.64(.40)	-6.35(2.90)*
Agreeableness*Openness	-.67(.45)	-.18(.48)	-3.32(3.49)
Conscientiousness*Openness	.20(.61)	-.04(.65)	.08(4.73)
Neuroticism*Openness	-.28(.38)	-.44(.41)	-2.97(2.94)
Openness*Openness	.79(.33)*	.67(.36)+	6.30(2.57)*
F test	1.69	1.37	1.85

Note: Estimation coefficients are reported in the table, standard errors are in parentheses.

Instrumental variables (2SLS) regression

	Customer Satisfaction
Controls	
Customer Contact	-.00(.00)
Unit size	-.00(.00)
Median Income	.00(.00)
Customer Respondent Number	.00(.00)**
Predictors	
Service Climate	.96(1.57)
Food Quality Climate	1.22(1.39)
Service Climate * Food Quality Climate	-.25(.34)

Note: * $p < .05$ ** $p < .01$ *** $p < .001$; Sargan chi2(7) = 8.48 (p = 0.29). Estimation coefficients are reported in the table, standard errors are in parentheses.

2.11 Appendix C. Leader Personality and Unit Size as Instrument Variables

First-stage Regressions

	Service Climate	Food Quality Climate	Service Climate * Food Quality Climate
Controls			
Customer Contact	.00(.01)	.01(.01)	.05(.05)
Median Income	.00(.00)	.00(.00)	.00(.00)
Customer Respondent Number	-.00(.00)	-.00(.00)	-.00(.00)
Instruments			
Extraversion	-.06(.49)	-.40(.49)	-1.76(3.74)
Agreeableness	.30(.46)	-.13(.46)	.81(3.51)
Conscientiousness	-.17(.39)	.24(.39)	.19(3.00)
Neuroticism	-.22(.32)	.09(.32)	-.63(2.47)
Openness	.31(.42)	.14(.42)	1.95 (3.23)
Unit Size	-.01(.03)	-.02(.03)	-.11(.20)
Extraversion*Unit Size	.00(.01)	.01(.01)	.05(.08)
Agreeableness*Unit Size	-.00(.01)	.01(.01)	.00(.07)
Conscientiousness*Unit Size	.00(.01)	-.00(.01)	-.02(.04)
Neuroticism*Unit Size	-.00(.01)	-.01(.01)	-.03(.05)
Openness*Unit Size	.00(.01)	.00(.01)	.02(.06)
F test	.91	.77	.91

Note: Estimation coefficients are reported in the table, standard errors are in parentheses.

Instrumental variables (2SLS) regression

	Customer Satisfaction
Controls	
Customer Contact	.00(.00)
Median Income	.00(.00)
Customer Respondent Number	.00(.00)*
Predictors	
Service Climate	1.76(1.72)
Food Quality Climate	1.54(2.31)
Service Climate * Food Quality Climate	-.39(.48)

Note: * $p < .05$ ** $p < .01$ *** $p < .001$; Sargan chi2(8) = 4.72 (p = 0.79). Estimation coefficients are reported in the table, standard errors are in parentheses.

2.11 Appendix D. Unit Size and Median Income as Instrument Variables

First-stage Regressions

	Service Climate	Food Quality Climate	Service Climate * Food Quality Climate
Controls			
Customer Contact	.00(.01)	.00(.01)	.02(.04)
Customer Respondent Number	-.00(.00)	-.00(.00)	-.00(.00)
Instruments			
Median Income	.00(.00)	-.00(.00)	.00(.00)
Unit Size	.01(.01)	-.00(.01)	.01(.11)
Median Income*Unit Size	.00(.00)	.00(.00)	-.00(.00)
F test	.51	.44	.56

Note: Estimation coefficients are reported in the table, standard errors are in parentheses.

Instrumental variables (2SLS) regression

	Customer Satisfaction
Controls	
Customer Contact	.00(.01)
Customer Respondent Number	.00(.00)
Predictors	
Service Climate	2.91(7.19)
Food Quality Climate	3.94(6.52)
Service Climate * Food Quality Climate	-.76(1.68)

Note: * $p < .05$ ** $p < .01$ *** $p < .001$. Estimation coefficients are reported in the table, standard errors are in parentheses.

CHAPTER 3. CLIMATE STRENGTH: A REVIEW AND SYNTHESIS

3.1 INTRODUCTION

Since the early 1990s, theories and empirical evidence of organizational climate research have accumulated on the role that climate strength plays in organizational life. Organizational climate refers to employees' shared perceptions of the policies, procedures and practices that are rewarded, supported and expected in a given organizational environment (Schneider, 1990). Initially, organizational climate has been conceptualized as a generic concept (i.e., molar climate) and reflects various respects of organizations (e.g., Glick, 1985; James, Joyce and Slocum, 1988). With the development of the concept, organizational climate then includes a specific focus, that is, focused climate. Focused climates are different from molar climate in that they only focus on one particular aspect of organizations, for example, service, safety, diversity or justice.

There are two facets of the organizational climate construct, that is, climate level which refers to the average of employee perceptions of an organization's policies, practices and procedures, and climate strength which refers to the degree of agreement or consensus among employee perceptions (Chan, 1998; Colquitt et al., 2002; Schneider, Salvaggio and Subirats, 2002). This paper mainly focuses on climate strength. Since the term climate strength has been coined, it has fueled numerous studies on its antecedents and consequences, and its role as a moderator in the relationship between organizational climate and organizational outcomes (e.g., Schneider et al., 2002; Dawson et al., 2008; Colquitt et al., 2002; Klein et al., 2001; Roberson, 2006). Research on climate strength has been conducted in the areas of both molar climates and focused climates, such as jus-

tice climate, safety climate and service climate (Lindell & Brandt, 2000; Naumann & Bennett, 2000; Zohar & Luria, 2004; Potocnik et al., 2011).

The endogeneity issue in organizational climate research has been largely ignored. The vast majority of studies have treated organizational climate, both climate level and climate strength, as if they were exogenous (e.g., Schneider, Salvaggio, & Subirats, 2002; Bernhardt, Donthu, & Kennett, 2000). However, organizational climate is actually an endogenous variable, rendering its two facets endogenous too. There are several reasons for climate strength and climate level to be considered endogenous – for example, omitted variable bias, measurement error and common method bias (cf. Antonakis, Bendahan, Jacquart, & Lalive, 2010) – and the endogeneity problem may render estimates causally uninterpretable. Because hardly any studies have considered the endogeneity issue in climate strength research, this paper tries to fill this gap and provide suggestions on addressing it in future research.

To have a holistic understanding of climate strength research and to potentially move forward the literature, the objective of this paper is to provide an extensive literature review of climate strength and offer suggestions for future research. The paper contributes to climate strength research in several ways. First, our review provides a foundation for theorizing the antecedents and influencing process of climate strength. Specifically, we provide taxonomy on the antecedents and direct outcomes of climate strength. This taxonomy offers a basis for understanding the factors that may contribute to climate strength and the influencing processes of climate strength. Second, we discuss the mixed findings regarding the moderating effect of climate strength. By doing so, we provide possible explanations for why the moderating effect of climate strength sometimes works and some-

times does not. On the basis of our extensive literature review, we provide an integrated theoretical model of climate strength (see Figure 3.1). Third, we offer three main reflection points for climate strength research, namely, the relationship between climate level and climate strength, endogeneity problem in organizational climate research, and inconsistent results regarding the influence process of climate strength.

3.2 REVIEW OF THE CLIMATE STRENGTH LITERATURE

3.2.1 Definition of Climate Strength

Following the lead of prior research (e.g., Bowen and Schneider, 2014), we define climate strength as consensus among employee perceptions about their unit's organizational climate. This consensus captures the extent to which employees share the same view on organizational climate. As a unit-level property, climate strength is operationalized as within-unit variability, as either the standard deviation, r_{wg}, or the average deviation index (Smith-Crowe, Burke, Kouchaki, and Signal, 2013) of service climate ratings by a business unit's employees. Chan (1998) referred to climate strength as the dispersion of organizational climate scores within a unit, thus more dispersed organizational climate scores are equivalent to lower climate strength. Dispersion of organizational climate scores can result from true differences in employees' organizational climate perceptions and/or random error. Therefore, the construct of climate strength must be based on a substantive theory.

Climate researchers (cf. Schneider et al. 2002; Bowen and Ostroff, 2004) provided a theory arguing that climate strength was indicative of the strength of a situation (Mischel, 1973). Organizational climate can denote a positive situation, and climate strength captures how strong the situation is, that is, the more employees hold similar perceptions

about the situation, the stronger the situation is. Similarly, organizational climate is a situational force that constrains employee behaviors according to a situationist view of psychology, and a strong organizational climate is more likely to produce uniform employee behaviors than a weak climate.

In light of the emphasis that Schneider et al. (2002) place on the influence of climates on behaviors, the climate concept takes on a normative connotation. That is, when organizations and their leaders attempt to influence their employees' climate perceptions, for example through HRM practices, they seek to regulate employee behaviors that concern customers. The effectiveness of this normative function of organizational climates is dependent on their strength or, to use the terminology of research on norms (Jackson, 1966), their crystallization. At least some consensus about rewarded, supported, and expected behaviors is needed in order to enforce enactment of these behaviors (cf., Hackman, 1992).

3.2.2 Systematic Review and Coding

With a clear definition of climate strength, we conducted a systematic review of the literature. To locate papers on climate strength, we used several search techniques. First, we searched for published studies in databases, such as Google Scholar, PsycINFO and Business Source Premier, with the key words *climate strength, strength of climate, climate consensus, consensus of climate, climate agreement, and agreement of climate, etc*. Second, we manually searched the above-mentioned keywords in management and business journals, notably in journals such as *Academy of Management Journal, Human Resource Management, Journal of Applied Psychology, Journal of Management, Journal of Management Studies, Journal of Organizational Behavior, Journal of Vocational Behav-*

ior, Management Science, Organizational Behavior and Human Decision Processes, Organization Science, Organization Studies, and Personnel Psychology. Third, we checked the references of existing narrative reviews and meta-analyses on organizational climate (e.g., Gonzalez-Roma and Peiro, 2014; Schneider et al., 2013; 2017). Fourth, we searched for unpublished research, including dissertations and conference proceedings. A thorough literature search revealed 47 studies.

Because of our interest in climate strength as a collective property, we included only those studies that were at the aggregate level of analysis. Multi-level studies that examined the cross-level influence of climate strength were thus excluded. This exclusion resulted in a total of 27 articles.

In coding the articles, we find that the literature on climate strength can be organized with three focuses: antecedents of climate strength, outcomes of climate strength, and climate strength as a moderating variable. Below, we summarize the literature along these three dimensions.

3.2.3 Results of the Systematic Review

The Taxonomy of Antecedents of Climate Strength. The antecedents of climate strength can be organized into five categories: employee diversity, unit size, social interaction and communication, leadership and organizational characteristics. Please see Table 3.1 for details.

Insert Table 3.1 about here

Employee diversity assesses how diverse group members are in terms of their background information, including age, gender, education, tenure, functioning background, pay, etc. The rational for the effect of employee diversity on climate strength is based on the similarity-attraction paradigm (Byrne, 1971). The similarity of employee demographics not only fosters attraction among employees, it also triggers communication, integration and cohesion (Gonzalez-Roma and Peiro, 2014), which facilitate the collective sense-making among employees regarding the climate (Roberson, 2006). This collective sense-making process consequently results in a group of people perceiving organizational climate in a homogeneous way and thus a strong climate (Klein et al., 2001; Naumann and Bennett, 2000). In contrast, units with greater employee diversity tend to have weaker climate strength (Colquitt et al., 2002). The relationship between employee diversity and climate strength has received support with data from teams in manufacturing firms (e.g., Colquitt et al., 2002) and received partial support with data from groups in manufacturing plants (Klein et al., 2001). However, some studies cannot find support for this relationship (Naumann and Bennett, 2000; Roberson, 2006; Wang et al., 2013).

Some studies examine unit size as an antecedent of climate strength. Unit size refers to the total number of employees in a given unit. Prior research indicates that unit size is an important factor for the formation of homogeneous perceptions, because employees in small units have more opportunities for interaction and contact than do employees in large units (Gonzalez-Roma et al., 2002; Colquitt et al., 2002), and the frequent interaction and contact may facilitate the convergence of employee climate perceptions. For example, Colquitt et al. (2002) find a negative correlation between team size and procedural justice climate strength in manufacturing teams. Some studies (e.g., Gonzalez-Roma et

al., 2002; Roberson and Williamson, 2012), in contrast, cannot find a significant correlation.

Social interaction and communication assess how often employees talk to their colleagues or leaders, or how often employees coordinate to get their jobs done. Examples include social interaction, discussion, communication density and centralization, group cohesion, work interdependence, etc. The symbolic interactionist perspective of climate theory suggests that social interaction and communication trigger the formation of organizational climate (Ashforth, 1985; Gonzalez-Roma et al., 2002; Luria, 2008). It is through social interaction and communication that employees discuss their interpretation and understanding of organizational practices, procedures and policies and subsequently develop shared perceptions (Ashforth, 1985; Gonzalez-Roma et al., 2002). The relationship between social interaction/ communication and climate strength receives empirical support with data from teams in manufacturing firms, work units in public health service, groups in manufacturing plants, soldier groups, bank branches, and student teams (Colquitt et al., 2002; Gonzalez-Roma et al., 2002; Klein et al., 2001; Luria, 2008; Numann and Bennett, 2000; Roberson, 2006).

It has long been revealed that leaders are important agents in the creation of organizational climate (e.g., Schein, 1985; Kozlowski & Doherty, 1989; Schneider, Gonzalez-Roma, Ostroff, & West, 2017). Leaders act as interpretative filters of organizational practice, procedures and policies, and leader behaviors and leader-member exchange provide a basis for the formation of employees' climate perceptions (Kozlowski & Doherty, 1989). Previous research shows that leaders who demonstrating informing behaviors, being visible in implementing and enforcing the policies and procedures, being transforma-

tional, and showing simple supervisory styles promote within-unit perception consensus among employees (Gonzalez-Roma et al., 2002; Luria, 2008; Naumann and Bennett, 2000; Zohar and Luria, 2004). In contrast, passive leadership which involves little individualized consideration or concern for employee performance tends to impair consensus (Luria, 2008). Supportive results have been found widely in the literature, for example, work units in public health service, soldier groups, bank branches, and platoons (Gonzalez-Roma et al., 2002; Luria, 2008; Naumann and Bennett, 2000; Zohar and Luria, 2004; Zohar and Tenne-Gazit; 2008). Wang et al. (2013), however, do not find a significant correlation between transformational leadership and innovation climate strength.

Organizational characteristics describe an organization's internal structural factors and external environmental factors. Internal structural factors include training, staffing, employee participation, job security and alike, whereas external environmental factors include an organization's involvement in the industry and community (Lindell and Brandt, 2000; Li, 2010). We generally call these internal and external factors organizational characteristics. The rational is that organizational characteristics serve as discretionary stimuli that may differently influence individual employees' interpretations of organizational climate, resulting in a systematic variation in climate perceptions (Lindell and Bennett, 2000). Improving the conditions on these internal and external factors thus may help reduce the variance in perceptions, thus contributing to a strong climate. Supportive results have been found in hotels and a combination of various organizations (Li, 2010; Lindell and Brandt, 2000).

Moderating Effect of Climate Strength. The vast majority of research on the influence of climate strength has focused on its moderating effect—whether climate strength

moderates the relationship between organizational climate and aggregate-level outcomes, such that the effect of organizational climate is stronger when climate strength is high than when it is low. Strong climate strength is like a magnifying glass that brings into focus the existing climate and thereby enhances its effects. In this case, a positive service climate would yield positive service behaviors to a greater extent, and a negative service climate would yield worse service behaviors. In contrast, when climate strength is low, a lack of consensus clouds or makes the existing climate opaque, so that the climate has only reduced effects and whether organizational climate is positive or negative would matter less for employee and organizational outcomes. In addition, composition models (e.g., Chan, 1998) provide a more methodological lens on the moderating effect. According to the direct consensus model, a climate is said to exist when employees within the unit sufficiently agree on it. And the higher the agreement, the more crystallized a climate is.

The moderating effect of climate strength receives empirical support in a number of studies. Schneider, Salvaggio and Subirats (2002) test the moderating effect of climate strength on the relationship between four dimensions of service climate and customer perceptions of service quality in a U.S. sample of 134 bank branches. A significant interaction is only found for one dimension of service climate, namely managerial practices. This moderating effect of climate strength is stable, showing up in both cross-sectional and 3-year longitudinal analyses.

Colquitt, Noe and Jackson (2002) examine the moderating effect of climate strength in the relationship between procedural justice climate and team performance and absenteeism in a sample of 88 work-units from an automobile parts manufacturing company.

Results lend support to their hypotheses that the effects of procedural justice climate are stronger on both team performance and absenteeism when climate strength is high.

Gonzalez-Roma, Peiro, and Tordera (2002) investigate the moderating effect of climate strength in the relationship between three climate facets (i.e., support, goals orientation, and innovation) and work satisfaction and commitment. Three out of the six interactions are significant. Data of this study come from 197 work units in a regional public health service.

Although the findings are mixed, empirical support for the moderating effect of climate strength as in the above-mentioned three papers is found in subsequent research. Moliner and colleagues (2005) in a Spanish sample of hotels, Sanders, Dorenbosch and de Reuver (2008) in a sample of hospitals, Gonzalez-Roma, Fortes-Ferreira and Peiro (2009) in a Spanish sample of bank branches, Ahearne and colleagues (2010) in a sample of pharmaceutical sales teams, Potočnik and colleagues (2011) in a Spanish sample of hotels and restaurants, Sanders, Geurts and van Riemsdijk (2011) in a combined sample of supermarkets in Czech Republic, Poland, and Slovakia, Bogaert and colleagues (2012) in a Belgian sample of academic departments, Shin (2012) in a Korean sample of companies, Drach-Zahavy and Somech (2013) in an Israeli sample of hospital units, Sora and colleagues (2013) in a Spanish sample of organizations in the food industry, education and retail, Wang and colleagues (2013) in a Chinese sample of teams in organizations in various industries, and finally, Whitman and colleagues (2012) in a meta-analysis, find full or partial support for the moderating effect of climate strength in the relationship between organizational climate and outcomes.

However, there are studies cannot find any support for the moderating effect of climate strength. For example, Sowinski, Fortmann, and Lezotte (2008) in a U.S. sample of automotive service stores, Dawson et al. (2007) in a U.K. sample of hospitals, and Grizzle, Zablah, Brown, Mowen, and Lee (2009) in a U.S. sample of restaurants, Zohar and Luria (2004) in a sample of platoons, and Rafferty and Jimmieson (2010) in an Australian sample of teams from a law enforcement agency do not replicate the findings in the studies reviewed in the preceding paragraph.

In sum, given the multiple dimensions on which extant studies differ (e.g., different organizational climates and outcomes measures; samples from different countries and industries; samples of units from the same organization or samples of different organizations), possibilities for the inconsistent findings on the moderating effect of climate strength can be various. Schneider et al. (2013) propose that the detection of moderating effects of climate strength is likely affected by the variability of climate strength across the sampled units. Detecting interactions is more likely when there is variance in the moderator, and typically, when effects are not found, the variability of service climate as the moderating variable is low.

The Taxonomy of Direct Outcomes of Climate Strength. Prior research shows that climate strength might have a direct effect on organizational outcomes. We categorized the outcomes of climate strength into three categories: employee attitudes, job performance, and customer service performance. Please see Table 3.2 for details.

Insert Table 3.2 about here

Employee attitudes refer to employees' beliefs, evaluations and feelings at work, including job satisfaction, organizational commitment, efficacy, trust, burnout, work involvement, well-being, etc. at the collective level. Job performance assesses employee performance as well as organizational performance. Examples include team performance, turnover rate, organizational performance, team potency, financial team performance, organizational citizenship behaviors, and profitability. The rational of the effect of climate strength on employee attitudes and job performance is similar. High climate strength indicates that employees have very similar interpretations and understandings regarding important aspects of the organization, which may lead to high efficiency and smooth coordination (Dawson et al., 2008). An efficient and coordinative unit makes employees feel happy and calm at work and well perform at their jobs. In contrast, when there is no consensus on the organizational climate, employees might co-ordinate their behaviors to a lesser degree and experience friction and conflict with colleagues regarding the standards for appropriate behaviors. Friction and conflict then lead to process losses and ultimately negative employee attitudes and a loss of aggregated performance (Lindell & Brandt, 2000; Sowinski et al., 2008; Gonzalez-Roma and Peiro, 2014). Significant correlations between climate strength and employee attitudes have been found in army companies, universities, service organizations and hospitals (Bliese and Halverson, 1998; Bogaert et al., 2012; Moliner et al., 2005; Sanders et al., 2008). Some studies, however, only find partially supportive results (Rafferty and Jimmieson, 2010; Gonzalez-Roma et al., 2002). In terms of job performance, existing studies reveal mixed results with data from automotive service stores, hospitals, pharmaceutical sales teams, and bank branches (Sowinski et al., 2008; Dawson et al., 2008; Ahearne et al., 2010; Gonzalez-

Roma et al, 2009), and some studies find insignificant correlations between climate strength and job performance (Grizzle et al., 2009; Shin, 2012; Colquitt et al., 2002; Lindell and Brandt, 2000; Zohar and Luria, 2004).

Customer service performance assesses customer service-related performance, and this performance was measured by external evaluators to the organizations. Examples include customer satisfaction and customer-perceived service quality. Climate strength might have a direct effect on customer outcomes because when there is high consensus on the climate, customers can expect to receive consistently the same service be it from different employees or be it at different points in time. Given that customer evaluations of service can be conceptualized as the differences between expected service quality and actual service quality (Anderson, 1973; Anderson & Sullivan, 1993; Oliver, 1980), customers are less likely to experience surprises when service climate strength is high. When climate strength is low, however, customer might experience no surprises, positive surprises, or negative surprises, and this uncertainty about what to expect likely drives down customer perceptions of service quality and their satisfaction. Among the extant studies, significant effects are found in Potočnik et al. (2011), Sowinski (2007) and Pugh et al., (2012). In contrast, for example, Schneider et al. (2002), Sowinski et al. (2008) and Auh et al. (2011) do not discover such a direct effect.

In addition to a direct linear effect, some studies examine a curvilinear effect of climate strength on outcomes. For example, Potočnik et al. (2011) propose inverted U-shaped relationships between climate strength and customer service quality perceptions. Similarly, Dawson et al. (2008) propose inverted U-shaped relationships between climate strength and climate for well-being, climate for quality and climate for integration. Sup-

posedly, climate strength has a positive direct effect on outcomes up to an optimum level, as increasing consensus facilitates co-ordination and consistency in behaviors and performance. Beyond the optimum level, however, climate strength has a negative effect on outcomes, because too much consensus might result in inflexibility in light of varying job demands and complacency. Potočnik et al. found mixed support for such a curvilinear effect of climate strength. They reported a curvilinear effect of the strength of one service climate dimension, customer orientation, on customer perceptions of relational quality, but only in a 3-month longitudinal analysis. Dawson et al. (2008) only found a curvilinear effect of climate strength on organizational performance for climate for integration dimension.

To sum up, the inconsistency in findings of direct effect of climate strength on outcomes is as startling as is the inconsistency in findings of moderating effect. As for the moderating effect of climate strength, a lack of variability in climate strength across units might be a methodological candidate for explaining null results. A second methodological candidate is the statistical non-independence of climate strength and organizational climate (Cole, Bedeian, Hirschfeld, & Vogel, 2011; Lindell & Brandt, 2000). The relationship among these two variables takes on the form of a U: Climate strength is highest (i.e., at its maximum) when organizational climate is either at its minimum or at its maximum. Because of this relationship, climate strength and organizational climate likely explain overlapping variance in outcome variables, or stated differently, the amount of variance uniquely explained by climate strength is reduced (Ehrhart, Schneider & Macey, 2014). Alternately, as climate strength concerns consensus, it might be more suited to predict consensus in outcomes rather than the levels of these outcomes.

Summary of the Existing Literature and an Integrated Research Model

Based on our literature review, an integrated research model of the antecedents, consequences, and moderating effect of climate strength is shown in Figure 3.1. Specifically, employee diversity, unit size, social interaction and communication, leadership and organizational characteristics are antecedents of climate strength. Direct outcomes of climate strength include employee attitudes, job performance and customer service performance. Furthermore, climate strength moderates the relationship between organizational climate and outcomes.

Insert Figure 3.1 about here

Methodological Issues in Climate Strength Research. In reviewing the literature on climate strength, we also code for methodological issues in the field. I coded the literature separately for climate strength as predictor or moderator and climate strength as outcome. Table 3.3 reports frequencies on methodological issues when climate strength acts as a predictor or as a moderator in the relationship between climate level and outcomes. Twenty studies are identified. Six factors are considered and coded, namely, control for mean level, avoiding same source sampling, use of exogenous predictors, measures of non-perceptual independent variable, measures of non-perceptual dependent variable, use of correct estimator to deal with the endogeneity problem. Among the 20 studies, most of the studies (84%) control for climate level when examining the effect of climate strength. However, there still exist studies that do not control for the effect of climate level. More than half of the studies (55%) avoid using the same source for cli-

mate strength and outcomes. In these 20 studies we look at climate strength as the predictor or moderator. Given that this construct by nature is an endogenous construct, it is alarming to see that none of these studies use exogenous predictors. Similarly, organizational climate is a perception-based construct, making climate strength a perception-based construct as well. Therefore, all of the 20 studies use perceptual independent variables. Only one study (i.e., Sowinski et al., 2008) uses a non-perceptual dependent variable. Sowinski and colleagues examined the moderating effect of climate strength on the relationship between climate level and profitability and turnover rate, whereas data of the outcome variables come from organizations' corporate office. Unfortunately, none of the extant studies try to deal with the endogeneity issue with an appropriate estimation method. Ignoring the endogeneity problem results in a situation that all the results reported in the literature are correlational but not causal, and thus possibly confounded.

Table 3.4 reports frequencies when climate strength acts as an outcome. The same methodological factors are coded except for control for mean level, namely, avoiding same source sampling, use of exogenous predictors, measures of non-perceptual independent variable, measures of non-perceptual dependent variable, use of correct estimator to deal with the endogeneity problem. Eleven studies are identified. Among them, four studies (36.36%) avoid same source sampling. Only one study (9.09%) uses an exogenous predictor. Roberson (2006) used an experimental design to manipulate the predictors of climate strength, that is, treatment fairness. Experimental design ensures the effects of predictors are causal because any changes of the dependent variables come from the manipulation (Antonakis et al., 2010). More than forty-five percent of the studies use non-perceptual independent variables, namely, demographic diversity, including age,

tenure, gender, etc. Because all the studies use climate strength as dependent variable, non-perceptual dependent variable is used in none of these papers. Moreover, no existing studies use statistical remedies to overcome endogeneity.

Insert Tables 3.3 & 3.4 about here

3.3 DISCUSSION AND SUGGESTIONS

Our review of empirical research on service climate strengths leads to several observations of the whole climate strength literature, and based on which, we make suggestions for future research. First, to date, research on climate strength is still sparse albeit the volume of research on organizational climate is remarkable (several meta-analyses on molar and various types of focused climates, e.g., Carr et al., 2003; Hong et al., 2013; Wallace et al., 2016; Whitman et al., 2012). In principle, as long as organizational climate is aggregated up from individual-level perceptions, it is possible to test direct and moderating effects of climate strength. The insufficient research attention has been detrimental for organizational climate research because climate research could not rule out the role of climate strength when interpreting organizational climate effects. It is possible that "a meaningful increment to the prediction of organizational outcomes might be provided by the variance in members' climate perceptions" (p.332, Lindell and Brandt, 2000).

Second, our observation concerns the methodological issues in the climate strength research. Although most of extant research controls for climate level when examining the effect of climate strength, there are still some studies fail to do it, for example, Sander and colleagues (2008; 2011) and Moliner and colleagues (2005). This omission is prob-

lematic because it may lead to a mis-estimation of the effect of climate strength. Climate strength and organizational climate (also referred to as climate level) should be studied in tandem, especially that climate level should be controlled when study climate strength, because climate strength and climate level are not statistically independent of each other (Lindell and Brandt, 2000). As in Lindell and Brandt (2000), we discuss three typical possibilities in the relationship between climate strength (measured by variance) and climate level (measured by mean) in the case that organizational climate is measured with a five-point Likert scale. When climate level is extremely low, that is, climate level is 5, it means every respondent rates climate level as 1, variance can only be 0. Similarly, when climate level is extremely high, that is, climate level is 5, variance is also 0. If climate level is at a medium level, that is, climate level is 3, variance could have various values. One possibility is that all respondents rate organizational climate as 3, then variance is 0. Another possibility is that half of respondents rate organizational climate as 1, and the other half as 5, then the variance is 4. Lastly, if responses are uniformly distributed, then the variance of organizational climate is 2. As argued by Lindell and Brandt (2000), the functional dependence of climate level (denoted as M) and climate strength (denoted as sx2) is $sx2 = \sum(piXi2) - M2$, where pi is the proportion of respondents rate organizational climate as one of the five Likert scale. Given the interdependence between climate level and climate strength, climate level must be considered and included as a control variable when the focal construct is climate strength.

The big endogeneity problem in the organizational climate literature is more noteworthy. Fifty-five percent of the climate strength literature suffers from common method bias when climate strength acts as a predictor or moderator, and 36.36% when climate

strength acts as an outcome. Common method bias, which refers to the case that "independent and dependent variables are gathered from the same rating source" (p.1090, Antonakis et al, 2010), has been identified as one of the major threats to validity and as a cause for endogeneity (Antonakis et al, 2010). In addition to common method bias, our literature review reveals only one study that uses exogenous predictor for climate strength (i.e., Roberson, 2006 where she uses experiment). Using endogenous independent variables has also been categorized one threat to validity because endogenous predictors may be correlated with the error term and making the estimation inconsistent (Antonakis, et al., 2010).

A fundamental reason for why there is an endogeneity problem in climate strength research is that climate strength is a perception-based construct but not an objectively measured behavior. Climate perceptions are formed based on employees' observation of their working environment, including colleagues' behaviors, recognition and rewards employees receive, leaders' behaviors, physical facilities, etc. Most of these factors in the working environment are caused by other aspects, for instance, leader preference, resources from the company, local culture, industry norms, microeconomic shocks and alike. Furthermore, if outcome variables are also perception-based (which is mostly the case according to Tables 3.3 and 3.4), these organizational-level factors may at the same time impact the outcomes of climate strength.

Unfortunately, extant organizational climate and climate strength research on addressing the endogeneity problem is scarce, although the work of myself and my coauthors have tried hard to push forward the literature on this regard (for example, see Papers 1 and 2 of this thesis). Our coding shows that none of the existing studies use appro-

priate statistical remedies to overcome the endogeneity problem in climate strength research. We thus advocate future research seriously consider and address it with appropriate estimation strategies. We suggest future research avoid using same source sampling when collecting data for predictors and outcomes, try to use exogenous independent variables when studying the predictors of climate strength. Proper estimation can also purge endogeneity post hoc, for example, two-staged least square estimation (2SLS). In order to use 2SLS, it is critical to find valid and strong instruments for organizational climate, and the number of instruments should be at least as many as exogenous predictors (Antonakis et al., 2010). As stated by many scholars, finding exogenous instruments is hard work (e.g., Stock, Wright, and Yogo, 2002; Podsakoff et al., 2012). Potential candidates of instrumental variables for organizational climate include geographic factors (e.g., latitude, longitude, weather), census factors (e.g., income, population), unit fixed factors (e.g., store open time, belong to which service industry). Field experiments are also encouraged because manipulated variables are by definition exogenous, and can be used as instruments.

Third, our review enables us to gain a comprehensive understanding of the influence processes of climate strength. The influence process of climate strength included both its direct effect and moderating effect. The empirical results, be it for moderating, or direct effects of climate strength are highly inconsistent. We wonder whether the inconsistency in these results might in part be driven by methodological artefacts, notably low variability of climate strength across units. Extant organizational climate research predominantly justifies the aggregation of individual-level data to unit-level using a cut-off value of r_{wg}, for example, 0.6 (e.g., Schneider, White and Paul, 1998). Ensuring r_{wg} higher than 0.6 can

guarantee a certain level of agreement among employees, however, it restricts the variability of climate strength. Such restriction may lead to an underestimation of the effect of climate strength on organizational outcomes (Lindell and Brandt, 2000).

Moreover, we suspect that the mixed findings have also been influenced by factors that varied across studies. We discuss two factors in details below. They are measures of climate strength and climate type, and they may play roles in understanding effects of climate strength.

The discussion on a suitable index of climate strength has long been a major topic in extant research. Many indexes have been proposed, for example, standard deviation, r_{wg}, and average deviation index (AD), and almost all of them seem to have their own methodological advantages and limitations (Bedeian & Mossholder, 2000; Burke et al., 1999; Kozlowski & Hattrup, 1992; Lindell and Brandt, 2000). For example, after a review of the popular measurements for climate strength, Lindell and Brandt (2000) conclude that "r_{wg} clearly is the most appropriate index of climate consensus" (Lindell and Brandt, 2000, p.335). In a simulation study, Roberson and colleagues (2007) find that standard deviation is "an effective measure of dispersion when modeling strength or interaction effects" (Roberson et al., 2007, p. 564). Roberson and colleagues also reveal that the AD index performs nearly as well as standard deviation for detecting the interactive effect. Similar to this later point, Burke and colleagues (1999) argue that the AD index has various advantages over other measures such as r_{wg}. Given different measures' advantages and disadvantages, their validities in detecting the effect of climate strength may vary accordingly.

Regarding climate type, since Schneider (1975) proposes that organizational climate should be a climate for something, focused climate has been largely categorized into strategic climate and process climate. Strategic climate involves "the extent to which the organization's environment emphasizes a specific strategic outcome that can usually be measured by external criteria" (Ehrhart, Schneider, and Macey, 2014, p. 87), such as service climate and safety climate. Process climate focuses on "internal processes that occur in organizations as a part of daily organizational functioning" (Ehrhart, Schneider, and Macey, 2014, p. 87), such as procedural justice climate and ethical climate. Similarly, Burke and colleagues (1992) argue that organizational climate should be conceptualized as higher-order and first-order climates. They propose two higher-order climates in a service context: concern for employees and concern for customers. Combining these two schools of thoughts, organizational climates can be categorized into climate for strategic goals and climate for employees. The former concerns an organization's strategic goals and the latter concerns internal functioning and employee well-being.

The influence process of climate strength may vary for climate for employees (e.g., employee involvement climate, change participation climate, cooperative climate, procedural justice climate) and climate for strategic goals (e.g., service climate, safety climate). Because climate for strategic goals (e.g., climate for service) is related to a particular outcome (e.g., service quality), the climate thus is narrowed to this dimension (i.e., service) that is most relevant for prediction the outcome (Ehrhart, Schneider and Macey, 2014, p. 86). In this case, climate strength would function more effectively because the link between a climate and its outcome would be even more crystallized under a strong climate. In contrast, climate for employees involves internal factors about how an organization

functions. These internal factors may include leaders, groups and how employees are treated, and they may not necessarily be related to a specific outcome. When predicting outcomes, the wide manifestation of climate for employees may indicate a lower predictive power. Even if climate strength is strong, the link between climate for employees and outcomes of interest may not be as strong as that between climate for strategic goals and its corresponding outcomes.

3.4 CONSLUSION

In this paper, we provide a systematic literature review on climate strength. Based on our review, we provide taxonomy of the antecedents and outcomes of climate strength, and we discuss the moderating effect of climate strength. We synthesize the literature of climate strength in an integrated research model. Based on the literature review, we make three main observations, namely, the relationship between climate level and climate strength, endogeneity problem in organizational climate research, and the influence process of climate strength and provide suggestions to guide future research.

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Figure 3.1 Theoretical Model of Climate Strength

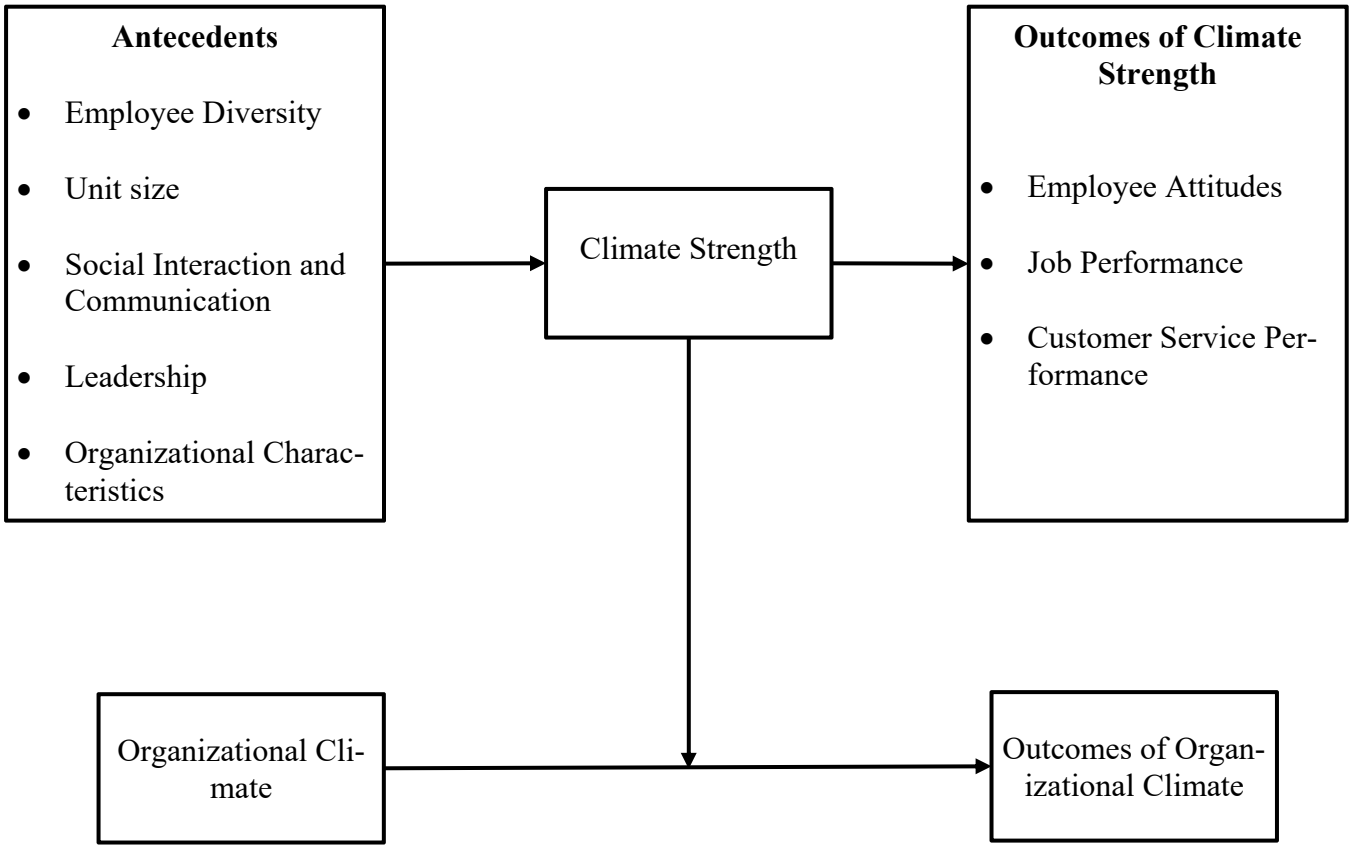


Table 3.1 Antecedents and Climate Strength

Antecedents	Climate Type	Resource
Employee Diversity • tenure • age • education • gender • pay • race • ethnic	• Procedure justice climate • Plant innovation climate • Financial resource availability (general) climate • Financial resource availability (MRP) climate • Procedure justice climate • Distributive justice climate • Innovation climate	Colquitt et al., 2002; Klein et al., 2001; Naumann & Bennett, 2000; Roberson & Williamson, 2012; Roberson, 2006; Wang et al., 2013
Unit Size • team size • unit size • platoon size	• procedure justice climate • support climate • goals orientation climate • innovation climate • welfare climate • service quality climate • safety climate	Colquitt et al., 2002; Gonzalez-Roma et al., 2002; Li, 2010; Roberson & Williamson, 2012; Zohar & Tenne-Gazit, 2008
Social interaction and Communication • social interaction • work interdependence • group cohesion • network density • discussion • communication • friendship	• support climate • goals orientation climate • innovation climate • financial resource availability (general) climate • financial resource availability (MRP) climate • safety climate • procedure justice climate • Distributive justice climate • safety climate	Gonzalez-Roma et al., 2002; Klein et al., 2001; Luria, 2008; Naumann & Bennett, 2000; Roberson & Williamson, 2012; Roberson, 2006; Zohar & Tenne-Gazit, 2008

Leadership • transformational leadership • leader informing behavior • supervisor visibility • passive leadership • simplicity of supervisory pattern • orientation of supervisory pattern)	• support climate • goals orientation climate • innovation climate • safety climate • procedure justice climate • innovation climate • safety climate	Gonzalez-Roma et al., 2002; Luria, 2008; Naumann & Bennett, 2000; Wang et al. 2013; Zohar & Luria, 2004; Zohar & Tenne-Gazit, 2008
Organizational Characteristics • Training • employee participation • job security • employee participation • job security • external contextual • Internal structural	• welfare climate • service quality climate	Li, 2010; Lindell & Brandt, 2000

Table 3.2 Climate Strength and Direct Outcomes

Climate Type	Outcomes	Resource
• Service Climate • Customer Feedback • Customer Orientation • Managerial Practices • Mean Emphasis • Climate For Well-Being • Climate For Quality • Climate For Integration • Employee Involvement Climate	**Customer Service Performance** • Service Quality • Service Behavior • Customer Satisfaction • Voluntary Turnover Rate • Store Profitability • Customer Satisfaction • Organizational Performance • Customer-Oriented Behaviors	Potocnik et al., 2011; Drach-Zahavy & Somech, 2013; Sowinski et al., 2008; Dawson et al., 2008 ; Grizzle et al., 2009 ; Auh et al., 2011; Pugh et al., 2012
• Interpersonal Climate • Leadership Empowerment Behaviors • Peer Relation Climate • Leadership Climate • Cooperative Climate • Support • Goal Achievement • Innovation	**Job Performance** • Team Potency • Psychological Well-Being • Affective Commitment • Team Performance • Financial Team Performance • Team Absenteeism	Ahearne et al., 2010; Bliese & Halverson, 1998; Bogaert et al. 2012; Gonzalez-Roma et al., 2009

• Distributive Justice Climate • Procedural Justice Climate • Interactional Justice Climate • Change Information Climate • Leadership Climate • HRM • Ethical Climate • Job Insecurity Climate • Procedural Justice Climate	**Employee Attitudes and Behavior** • Exhaustion Level and Strength • Cynicism Level and Strength • Efficacy Level and Strength • Role Ambiguity • Role Overload • Quality Of Worklife • Workgroup Distress • Commitment • OCBI • OCBO • Job Satisfaction • Work Involvement • Organizational Trust • Behavioral Typicality • Behavioral Similarity • Injury Rate • Security • Efficiency • Competency • Relationship	Moliner et al. 2005; Rafferty & Jimmieson, 2010; Sanders et al., 2011 ; Sanders et al., 2008 ; Shin, 2012; Sora et al. 2013 ; Colquitt et al., 2002 ; Gonzalez-Roma et al., 2002; Lindell & Brandt, 2000; Zohar & Luria, 2004; Schneider et al., 2002

Table 3.3 Coding of Methodological Issues – Climate Strength as Predictor or Moderator

	Control for Climate Level	Avoid Same Source Sampling	Use Exogenous Predictors	Non-Perceptual Independent Variable	Non-Perceptual Dependent Variable	Use Correct Estimator to Deal With Endogeneity Problem (e.g., IV Estimator)
Yes	17	11	0	0	1	0
No	3	9	20	20	19	20
Yes, %	84%	55%	0%	0%	5%	0%

Note: IV = Instrumental Variable, N = 20

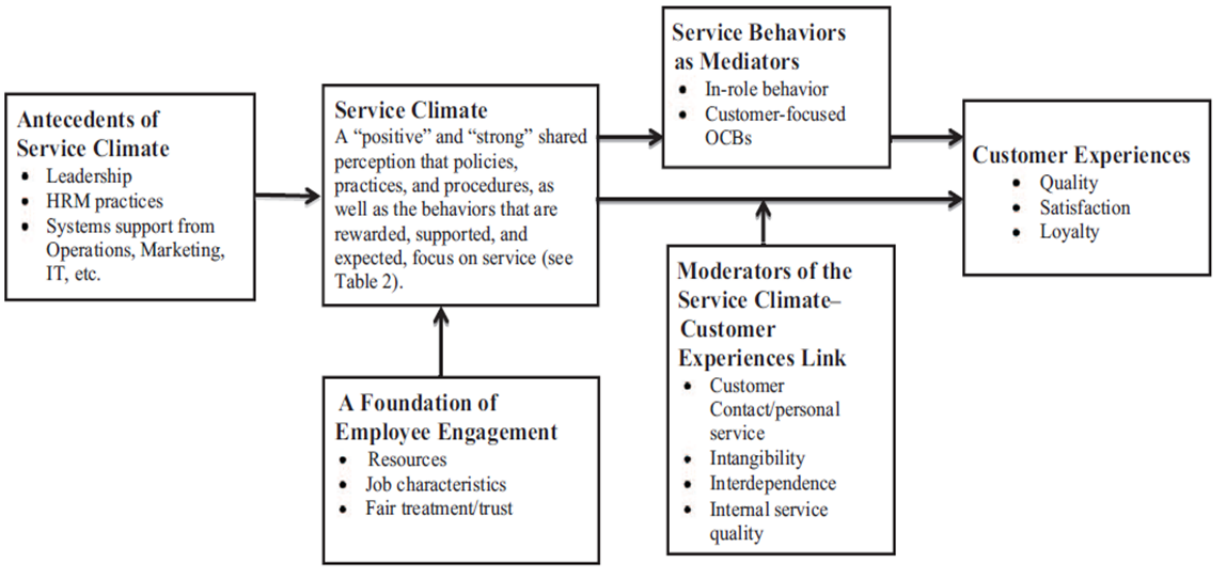
Table 3.4 Coding of Methodological Issues -- Climate Strength as Outcome

	Avoid Same Source Sampling	Use Exogenous Predictors	Non-Perceptual Independent Variable	Non-Perceptual Dependent Variable	Use Correct Estimator to Deal With Endogeneity Problem (e.g., IV Estimator)
Yes	4	1	5	0	0
No	7	10	6	11	11
Yes, %	36.36%	9.09%	45.45%	0%	0%

Note: IV = Instrumental Variable, N = 11

4. OVERALL CONCLUSION

Bowen and Schneider (2014) summarize the guiding theory and existing service climate research including its antecedents and consequences in an integrative framework (shown below). Below, I discuss how my thesis adds knowledge to this framework, and how the findings in the three papers can be extended to organizational climate in a broader manner.



Paper 1 offers new insights in understanding the service climate construct, that is, who perceives it and should provide the ratings of service climate. Because prior research predominantly uses only employees as raters of service climate, the major contribution of Paper 1 is including leaders as another source of service climate perceptions and treating leader-perceived service climate as a construct of interest. Our findings show that it is important to study leader-perceived service climate because it influences customer satisfaction, furthermore, customer satisfaction is high when leaders' service climate perceptions are high regardless of employees' perceptions. Although Paper 1 treats service climate as the focal construct, the results can be extended for other types of focused cli-

mates. Leaders' climate perceptions may matter for most of other focused climates such as diversity climate, safety climate, and justice climate or molar climate. No matter the types of climates, every incumbent employee in a given unit can perceive it and be influenced by it. It thus would be interesting for future climate research, be it molar climate or other types of focused climate, to incorporate leaders as raters of climate perceptions and to examine perceptual congruence on corresponding outcomes.

Paper 2 adds to the service climate framework by identifying another moderator of the service climate-customer experience link, that is, product quality climate. Paper 2 helps us gain a better understanding when service climate works better. More broadly speaking, this paper adds to the organizational climate literature by simultaneously examining two focused climates, that is, service climate and product quality climate. Examining multiple climates has received increasing research attention recently (cf. Bowen and Schneider, 2014; Kuenzi and Schmink, 2009). Although it has been advocated by several climate scholars, simultaneously studying multiple climates and examining their joint effects are still in the infancy. Paper 2 provides empirical evidence for the complementarity interaction between service climate and product quality climate. It indicates the necessity to studying the interplay between other focused climates and examining their complementary or competing effects.

Contributing to a better understanding of climate strength, Paper 3 provides a systematic review and synthesis of the climate strength literature. Our framework of climate strength, on the one hand, is a synthesis of the current literature of climate strength. On the other hand, it can be considered an extension of the organizational climate framework, for example, see Bowen and Schneider's (2014)'s service climate framework. Cli-

mate strength (how "strong" a climate is) has been treated as one facet of the climate construct (the other facet is climate level). Furthermore, climate strength has been treated as a moderator in the climate level-outcomes link. Therefore, a synthesis of climate strength research offers insights not only on facets of the organizational climate construct, but also on boundary conditions of the organizational climate-outcomes link.

In addition to the limitations mentioned in each paper respectively, there is one final remark when viewing the whole organizational climate literature. The extant literature of organizational climate is full of endogeneity problem, making it difficult to draw any causal inferences with regard to its effects. Endogeneity in organizational climate makes climate level and climate strength, the two facets of organizational climate, also endogenous. Although Papers 1 and 2 try to address the endogeneity problem with instrumental variable estimation, we can only report correlational results given the difficulty in finding good instruments. We discuss in detail the endogeneity in Paper 3 and provide directive suggestions of possible instruments for organizational climate. By overcoming the endogeneity problem, we can possibly push forward the literature and establish a causal chain of climate research.

In summary, my dissertation advances our knowledge of organizational climate from three aspects—including leaders as another source of service climate perceptions in addition to employees, studying multiple focused climates simultaneously and synthesizing the climate strength literature in meta-analytic review. I hope the three papers deepen our understanding of organizational climate, service climate and climate strength, and offer possible avenues for future research.